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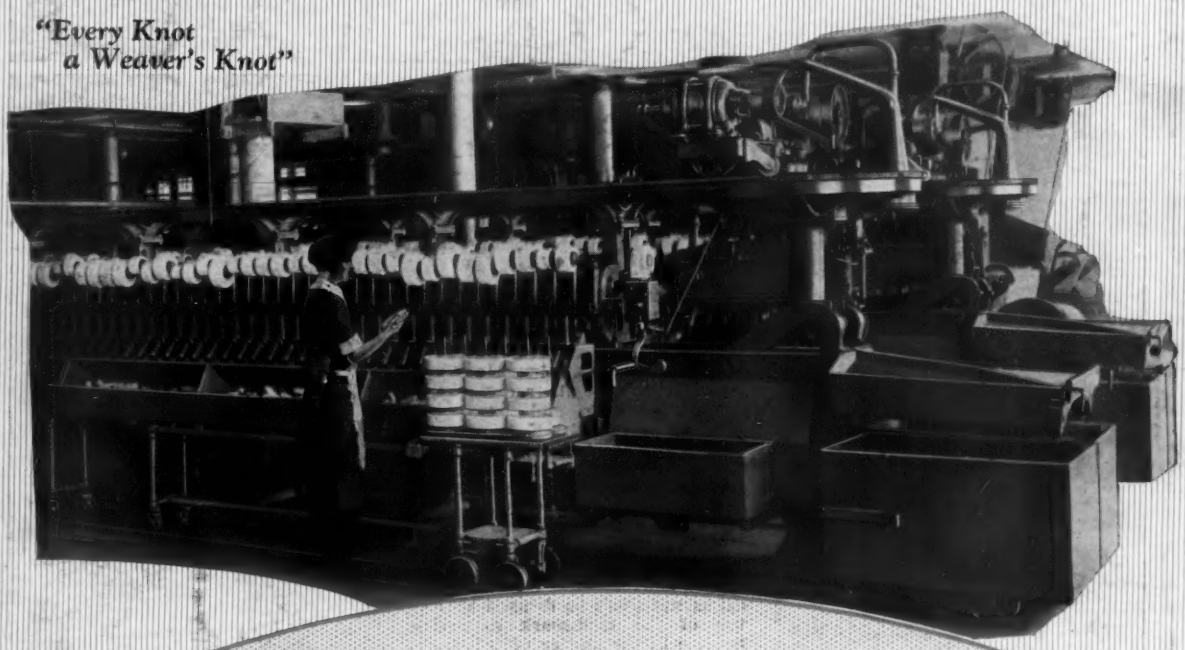
"Every Knot a Weaver's Knot"



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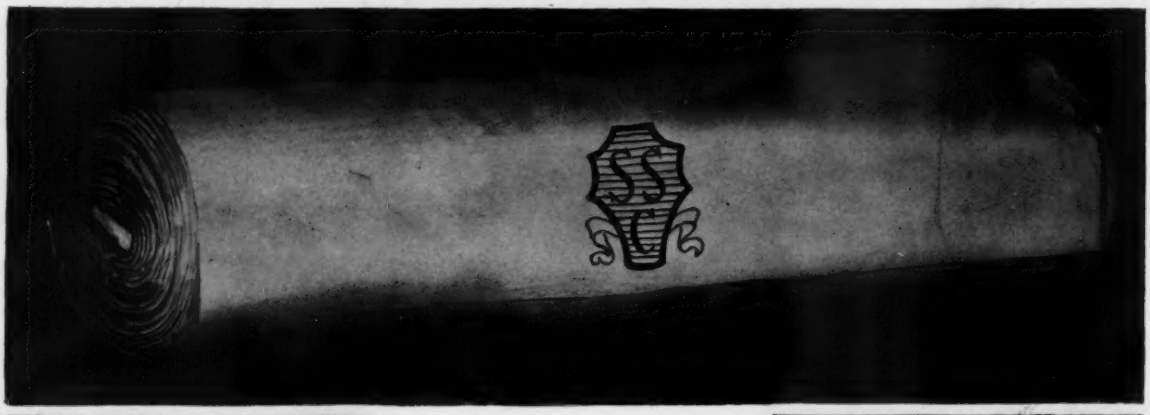

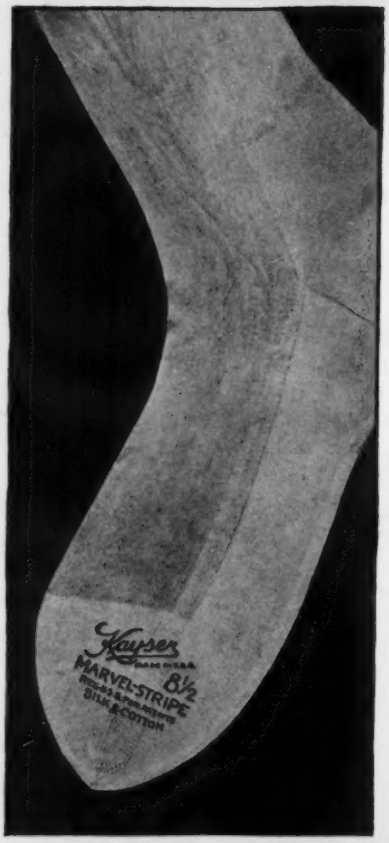

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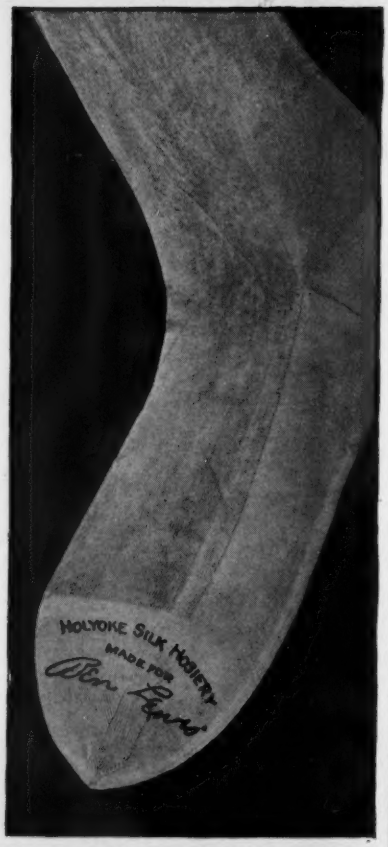

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Sledded and Snapped Cotton

The Problems It Presents To The Mill -

by Robert W. Philip-

The practice of snapping and sledding cotton which has become established in the great cotton-growing area of Texas and Oklahoma has been the outstanding radical change in methods involved in the harvesting of the crop. That it is something which cannot be neglected is apparent in the realization that upwards of four million bales were gathered from the crop of last year by these two methods, and the general tendency in the section affected obviously is toward an increase in the adoption of both practices.

This increase in use will apply especially to the sledding method, which is more radical in its departure from the regular manner of picking, and at the same time presents greater problems to the mill. In fact, it is known that agricultural experiment stations in Texas are developing a special type of cotton which will allow sledding; that is, a type which tends to mature all at one time and lose its leaves readily.

It is believed that beyond a general understanding of the situation, especially with reference to *sledded* cotton, comparatively few mills outside the affected area thoroughly appreciate the principles involved and the differences resulting from the newer methods of gathering cotton. The snapped variety has become more or less familiar to some mills, and it is felt that some men perhaps think of sledded cotton as being similar—just "trashy," etc. There is a tremendous difference, however. As one mill man expressed it, "Sledded cotton is everything that snapped is, and then a whole lot more—it presents an entirely different problem."

The able discussion of F. Gordon Cobb of the problems which the snapped and sledded cotton presents to the mill man, as published in the April issue of COTTON, provoked considerable interest in the subject. The writer took advantage of a recent trip to Texas to investigate the question, and will endeavor to outline something of how these methods are carried out in the hope of furthering the mill man's background with regard to the situation.

Both snapping and sledding are the result of conditions confronting the western farmer in the harvesting of his crop. Snapping was first introduced. Many farmers found themselves with large crops of cotton and insufficient help to gather the crops late in the season before destruction by unfavorable weather conditions, and so harvesting production per man was increased by permitting him to snap the stem, or, as is the more general practice, to pull off the cotton boll, burr and all, without extracting the seed cotton from the hull. When the increase in production of gathering which this system afforded became evident, the practice became more general, until now whole crops are being snapped in this manner, and it is estimated that of last year's production, some three million bales were gathered by this method.

How Cotton is Sledded.

Sledding was a natural outgrowth of snapping. It is practiced almost exclusively in the western and north-western areas of Texas. It is essentially what the name "sledding" implies, there being two common methods. One is the use of a sled consisting of a body similar to a wagon bed, holding about 500 pounds of cotton, set on runners or wheels, and dragged by a team of mules down a row of cotton. There is a V-shaped groove lengthwise in the bottom of the sled, which rises toward the back. As this is dragged over the row the cotton bolls, burrs, stems and parts of the stalk are forced into the bed of the sled, and a man or boy walking alongside rakes the cotton into the sled with a fork.

The other and more common type of sled consists of a body with a series of metal fingers extending in front of

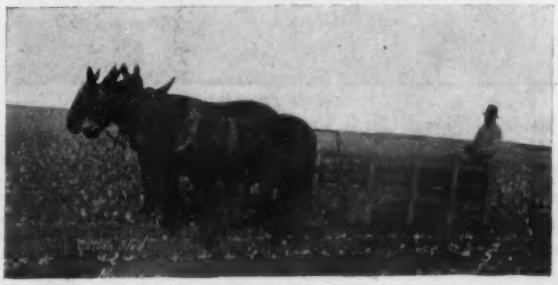


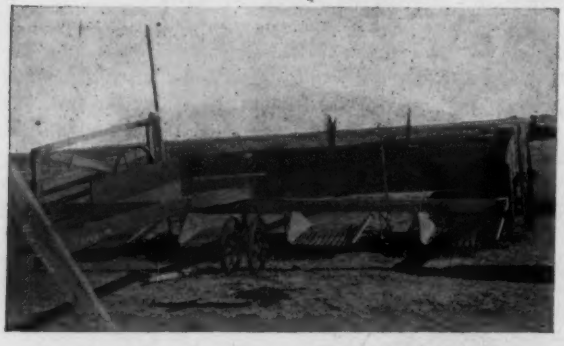
Photo by Daniel.

The Photograph to the Left at the Top of the Page Shows a Close-Up of a Sled, a General View of Which is Shown in This Picture.

The Cotton is Piled Up in this Manner after S ledding, Being Later Hauled Away in Wagons.

it, about one inch apart, as will be understood from the photograph used in the heading of this story. The ends of these fingers turn upward, and the fingers are adjustable to meet different height "stands" or plants. This sled is pulled along the cotton row, stripping off bolls and all, as it goes along. These sleds are home-made affairs, built for the most part by local blacksmith shops, and cost the farmer around $10 to $15 each. Most of the sleds now used harvest one row at a time, although gang sleds, to be pulled by two or more teams, and arranged to strip three and four rows at a time, have been designed and used. As the sleds are filled, the cotton is emptied in large concentrating piles over the fields, as another photograph shows, and is later hauled away in wagons.

It is estimated that upwards of 600,000 bales were gathered by the sledding method from last year's crop. Conditions almost peculiar to the western part of the state, however, will in a way restrict the use of sledding, *in its present form,* to that section. In the plains or Cap Rock section of Texas, the farmer cultivates his cotton only about three times, and does not chop it out, and the bolls all reach maturity within a comparatively short time so that there is only one picking. The stalk does not grow very high, and the land is sandy and extraneous growths are almost entirely absent. In addition, there is an apparently permanent lack of sufficient help for hand-picking, which has been mentioned, that is especially prevalent in this section. The sled functions best only under the conditions outlined and could not be used as it is now made in the major portions of the belt. Cotton cannot be sledded with the present equipment except under dry weather conditions, and these prevail for the West Texas farmer, who waits for the frost to remove the foliage from his plant, and then gathers the crop with one fell swoop.



This is a "Gang" Sled, Used to Strip Four Rows at One Time.

The Beginning of a Change in Harvesting.

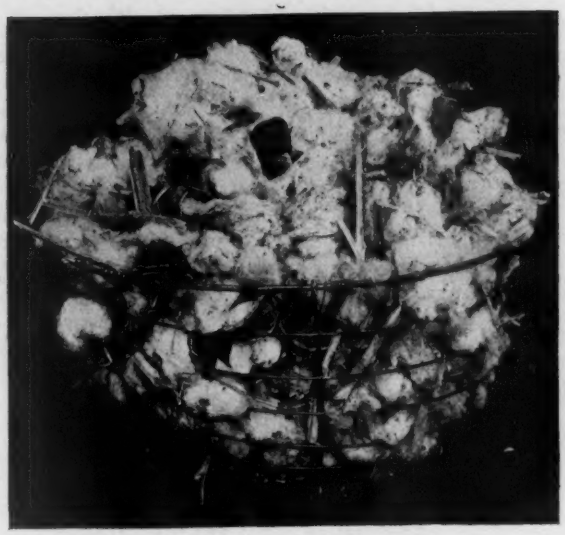
However, it is seriously felt in Texas, and among the progressive mill men giving the matter attention, that the introduction of the sled in the cotton fields was but the initial step of more significant developments. The original, crude, home-made sled now being most generally used is not at all selective. However, after the reception which it has received, inventive thought is being given to these first

Seven Sleds Shown in Line, Ready to Strip the Field.

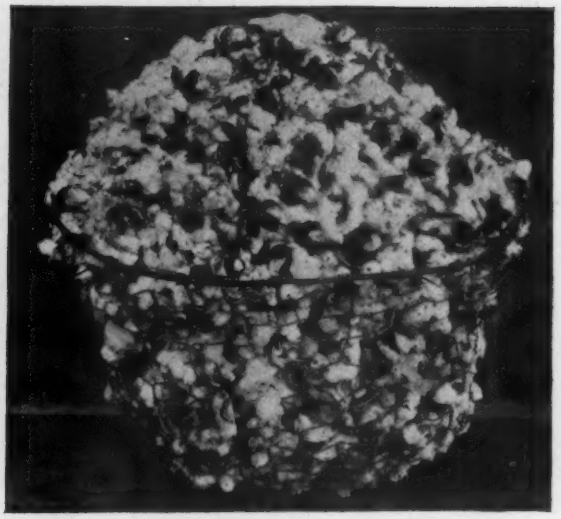
local efforts, and those most concerned do not doubt that mechanical harvesting in some form, is here to stay. It is certain that the sleds themselves will be improved and built along more efficient lines and operated better. At present everything taken in by the sled goes with the cotton to the gin; it is felt that refinements will be perfected which will produce a "selective" sled, one which will be equipped with means for separating in a preliminary way the cotton from the other materials, which will be returned to the field for their helpful effect upon the soil, as well as solving the problem of their disposition.

Thus, definite limits for the future cannot be placed upon the use of the sled. Improvements, the special type of seed referred to, and other factors, may extend its use over a much greater territory. One prominent mill executive made this startling prediction to the writer, "I believe you will see the majority of the crop sledded in five years, but sledding methods will be greatly improved."

Because of the extraneous matter gathered with the cotton, it requires from 2,000 to 3,000 pounds of sledded cotton to secure a 500-pound bale of lint cotton from the gin. With a sled and a team of mules, however, a man



A Basket of Sledded Cotton, Furnished by the Murray Company. This Sample Shows the Cotton as it Comes from the Field. It is cleaned and most of the foreign matter removed prior to ginning. Efforts are being made to produce a special seed for sledding that will permit sledding by maturing all at one time and lose its leaves readily.



A Sample of Snapped Cotton, Showing Whole Bolls, Some Unopened. This is subjected to pre-cleaning before ginning to remove hulls, etc. This sample shows the cotton as it comes from the field.

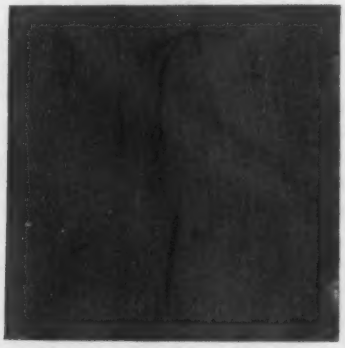
can gather two bales a day, the average being around one bale a day. It is true that the farmer receives a lower price for his cotton, but instances are cited where the gross amount received for the larger amount harvested in this manner was more than would have accrued to the farmer, at a higher price per pound, for the smaller amount he could have gathered by the regular method with his facilities and conditions. In other words, he reduces his cost of gathering to such an extent that he can make a profit selling it for a much lower price per pound.

Snapping the cotton has become more general than sledding, and has already extended over a larger area of the belt. As stated, this is performed by the picker gathering the entire boll, hull and all, instead of removing the seed cotton. It is possible for a picker to gather two and three times as much in this manner as by the regular hand-picking method.

New Methods of Cleaning Developed.

These new methods of gathering have presented a problem to the mill and gin. Particularly is this true of the sledded cotton. What confronts the gin is evident from an examination of the accompanying photographs, which show samples of snapped and sledded cotton as it comes from the field. To meet the situation, the various ginning machinery companies are supplying machines of a pre-cleaning nature, designed to remove the stalk, leaf, hulls, etc., and to extract the cotton from the hull prior to ginning; to "pick it at the gin," in other words. The Murray Company is supplying the Hancock cotton picker, and other types of machines for accomplishing the same purpose are being installed at gins in the areas affected by snapping and sledding.

An Exhibit of Card Strips Made from Sledded Cotton. Note the many strips of cotton stalk bark in this.



A Sample of Speeder Roving Made from Sledded Cotton. Close examination will show one of the slick, wiry pieces of bark, resembling jute, which will play havoc on the spinning frames. Enlarged two diameters.

A Problem for the Mills.

Such measures as are being adopted by the ginners are necessary in preparing the cotton for the ginning operation, and the equipment furnished seems to be coping well with the situation. Nevertheless, the mill is faced with a tough problem, as anyone who has encountered this cotton will agree. The sledded cotton, because of the greater amount of trash and foreign matter included by this method, presents the greater problem. As Mr. Cobb brought out in the April issue of COTTON, when the inner layer of the stalk, consisting of long, slick, strong fiber similar to jute, slips through the preparatory machinery in the mill, where it is almost impossible to remove it, these slick fibers won't draw on the spinning frame, and they produce about the same effect as if a man let some of the jute bagging through with the cotton. With the snapped cotton, when the hulls are not properly removed, the inside layer of the hull, or shale, beats up into the cotton and plays havoc in the mill.

A point applying to both cottons is that the additional cleaning made necessary causes the fiber to be handled more. The grade of the cotton seems to hold up fairly well, but the extraordinary amount of handling and cleaning obviously must affect the fiber. It is of common practice within the mill itself to endeavor to reduce the processes of beating in the thought that the reduced handling increases the strength of the yarn and makes for better running work.

Perhaps a word description of sledded and snapped cotton will assist in identifying it.

Sledded cotton ranges from Middling to the lowest grade. The grade depends upon the weather conditions and the percentage of unopened and immature bolls at the time of sledding. Sledded cotton that has opened well on the stalk, and has not had a rain on it, or too cold weather, turns out a good sample; on the other hand, cotton that is sledded late in the season, and has experienced all kinds of weather, turns out low grade samples. The cleaning of this cotton depends upon the length of time that it has been open in the field, and the weather conditions. All sledded cotton, after being ginned, will show small sticks, little parts of shale or burrs, some leafy trash and parts of the outside and inner bark of the stalk.

Snapped cotton is cotton that has been opened up and not picked out of the burr, both burr and cotton being pulled off of the stalk, as explained. Usually a small part of the stem also comes off in this operation, but the cotton is free of the stalk or outside or inner bark that is found in sledded cotton, and also almost free of leaves that might be on the stalk at the time of snapping. These grades will also vary as to the length of time the cotton has been in the field, and the weather conditions, ranging from Middling to very low grades. Freshly opened cotton, that has not been through cold weather or rains, causing the burr and short stems to rot, clean very easily and turn out good grades. The samples usually show up small pieces of shale or burr, small sticks or stems, some small leafy trash, and shows cotton excessively beaten, causing a large percentage of short and wasty staple due to the amount of cleaning machinery it goes through.

Pulled cotton is cotton that has had a late start and does not fully mature by the time cold weather sets in. About half of these bolls open just a little and the balance never open. These bolls are pulled and usually come off with part of the stem. The part-way opened and unopened bolls are run through boll breakers and cleaning machines, where the bolls are opened and the cotton is separated from the burrs and trash as much as possible. This cotton shows up in low grades, full of shale, burrs, stems, leafy trash, and the color is tinged, stained and yellow due to frosts or wet weather. The cotton is also of a wasty character on account of excessive beating and cleaning and is also usually of a weak staple on account of the immaturity of the cotton. Pulled cotton is usually the last of the crop, which has not had time to mature.

The main difference between sledded and snapped cotton is that sledded cotton has parts of the outer and inner bark and some more small trash, on account of the unopened and immature bolls. The bark is very similar to jute bagging in cotton, and does not cause much trouble in the card room, but just ruins the spinning room, for the bark is of a longer staple than the cotton and will not draft as the cotton does, causing the ends to come down and cutting up the leather rolls. The percentage of waste in sledded cotton is about 50 per cent greater than in picked cotton.

This brief article by no means covers the subject in a complete way. The purpose of it is only to present some general observations for the interest of the mill man, who is the ultimate one to deal with snapped and sledded cotton and with whom it is a matter of increasing concern.

Modern Factoring.

The Textile Banking Company, 50 Union Square, New York City, is distributing a booklet describing the function of the organization as factors. The company, it states, "was established for the purpose of conducting as a commercial banking institution a business which had for years been known as factoring, carried on under private partnership form, designated factors and commission merchants, who acted as selling agents as well as bankers for manufacturers, furnishing space for display and storage purposes, billed, packed and shipped the goods as and when sold, attended to all of the details—including credit investigations, assumed the credit risk on time sales and paid over to the manufacturer the net value of the accounts created upon delivery of the goods to the purchaser, while the customer was granted the usual trade terms through the facilities of the factor.

"In recent years," the booklet continues, the tendency "has been toward specialization in selling and extension of credit, and manufacturers have found that results are more satisfactory if their distribution is in the hands of their own selling organization, or selling agents, and the banking function delegated to the specialized organization of the factor." This function is the purpose of the company, it is explained, bringing together the necessary departments of credit, financing and accounting, as well as banking connections and credit lines, in one organization, the charge being based on the volume of sales consummated. Thus, it is explained, the manufacturer selling direct or through agents can use the services of the factor to enable the distribution for cash, avoiding credit losses, the risk of solvency of the purchaser being assumed by the factor upon approval of the sale before shipment of goods, as well as collection and details of accounting. The company also attends to clearance of foreign goods entering the country through customs.

With usual success the annual convention of the Southern Textile Association was held at Kenilworth Inn, Asheville, N. C., on Friday and Saturday, June 17th and 18th. The meeting was well attended and a well-rounded program presented. The occasion served as a further marker in the progress of the organization.

L. R. Gilbert, manager and superintendent, Audrey Spinning Mills, Inc., Weldon, N. C., was named president, succeeding W. H. Gibson, Jr., manager and superintendent, Aileen Mills, Inc., Biscoe, N. C. Carl R. Harris was elevated to the vice-presidency. Mr. Harris is also chairman of the spinning division, and is assistant superintendent of the Inman (S. C.) Mills. L. L. Brown, general superintendent, Clifton (S. C.) Manufacturing Co., and chairman of the weaving division of the Association, was named chairman of the board of governors.

L. R. Gilbert, the New President.

J. O. Corn was re-named to the board of governors. The following men were elected to fill vacancies: Frank S. Dennis, manager and superintendent, Consolidated Textile Corporation, LaFayette, Ga.; H. Gilmer Winget, superintendent Victory and Winget Yarn Mills, Gastonia, N. C.; D. Singleton Cook, agent, Pepperell Mfg. Co., Opelika, Ala.; and L. B. Gibson, superintendent, Fairmont (S. C.) Manufacturing Co. F. Gordon Cobb was re-elected as executive secretary, and J. M. Gregg returned as secretary-treasurer. These elections were made at the Saturday morning session.

President's Address.

The meeting was opened on Friday morning, June 17th, by President W. H. Gibson.

The first feature of the session was the annual address of the president. In beginning, Mr. Gibson commended the various division chairmen and the secretary for the work accomplished by the Association during the year. Continuing he said, "I don't want to prolong what I shall have to say, but there are a few matters I would like to cover. I think the South has come to realize the importance of the textile industry, and it is being looked upon today with a great deal more consideration than ever before. The industry has grown to such a point that has brought about many questions.

"We talk many times about efficiency of machines and the methods of operating them, but the greatest machine we have in the mills today, I think, is the human machine. If we have men of character and energy, pep, get-up, back-bone or whatever you please to call it; something in a man that makes him do things, we can then find the proper ways and means of getting the efficiency from the machines."

Mr. Gibson next discussed the matter of college men in industry, and directed a word of caution to the graduates, particularly those specializing in fancy designing. "We have today the theoretical man or college man, and the practical man, who seems to feel that the college man is educated for figures, whereas the college man feels that the practical man is more or less like a mule; he just knows how to work, that is all," said Mr. Gibson. "To my mind both are wrong. If the college man will use the training he received in school and go to the mill with the determination to learn the practical side and go to work, he will make good. The same is true of the practical man, if he will take the experience he has and apply it to the so-called book learning, and burn some midnight oil, he also can make good.

"What is the answer to our problem? If we haven't a man to begin with, then we cannot expect to succeed, but the real man always shows up, no matter where he started from. As the old saying is, it doesn't matter a durn where you started from, but it is where you get to that counts.

"One of the things I would like to say for the benefit of the men who are coming out of school this year and in particular the cloth designers; that is, to bear in mind that it is not always the most expensive pattern that makes

the most profit for the mill. Many designers, in designing a piece of cloth, do not take into consideration the cost, but try to display their skill and craftsmanship, regardless of cost. I would caution them to remember that the mill is in business to make a reasonable profit, and a great deal lies in the hands of the designer in laying the pattern to look as well as possible, at the same time keeping the cost in consideration."

The president next touched on the matter of mills moving to the South. "During the past year," he said, "we have had quite a number of mills and industries coming from the North to the South. This is all right in the eyes of the optimist. However, I wish to throw out the warning that we should not become over-enthused on account of this movement from the North to the South, because after a radical change of any kind there is more or less of a reaction, and if we do not mind, a good many of us who are taking stock of buying old worn-out machinery will soon find ourselves in the same position Massachusetts occupies today.

"There is another matter I would like to mention. I have noticed for the past few years that we have a good many busy-bodies who pretend to know more about the mill and the mill people than we do. We have people from all angles trying to interfere with the operation of the mills in the South—such as labor organizations, the children's bureau, the old maids and men and women who have nothing else to do, and even preachers with idle time trying to dictate to the mills how the plants should be run. I have no particular recommendation as to how to meet these various problems except as we have in the past tried to meet each proposition as it arose, but I would think that a great deal more attention should be paid to these various activities If the old maids, the law makers, the preachers and the labor organizations would apply their efforts in another direction than to the southern mills and the mill people, I feel that much more good would be accomplished."

In conclusion, Mr. Gibson expressed his appreciation to the textile magazines for publishing reports of the meetings of the Association, and to his fellow officers and the individual members for their cooperation with him.

Committee on Ethics.

Mr. Harris, chairman, presented a recommendation from the board of governors, which met on Thursday evening, that a committee to draft up a code of ethics for the association be appointed. The president named on this committee Oliver G. Murphy, superintendent, Shawmut Mills, West Point Mfg. Co., Shawmut, Ala., chairman; Marshall Dilling, and James A. Chapman, Jr.

Reports of Discussion Meetings.

Following several announcements, the reports of the discussion division chairmen were made.

J. O. Corn, Columbia, S. C., chairman of the carding division, reported first on the meeting of this section held in Charlotte on February 23rd. Since this and the other discussion meetings were reported in full detail at the time in COTTON, the Asheville reports will not appear here. However, Mr. Corn did summarize some of the main points discussed as follows. At the meeting, he said, "we first tried to list as many factors as possible which would affect breaking strength. There were exactly forty named. Among these was the production of the card. On print numbers we found that the general practice was to card from 600 to 650 pounds a week, but in some instances it was as high as 750 pounds. How much will it affect my breaking strength if I raise my production from 600 to 750 pounds or lower it to 450 pounds? It would be a great thing—and not an impossibility in my opinion—to determine that. An interesting report was made for the Arkwrights showing that when carding 16 pounds per hour, the breaking strength on 26s was 60 pounds; carding 12 pounds an hour, 69 pounds, and carding 8 pounds per hour, 70.43 pounds, or 17 3/10 per cent from the lowest. From this test there will be no argument that the 12 pound per hour production would be best in the end, for on a 15 per cent stronger yarn you could reasonably expect 2 per cent more from the weaving, saying nothing of the advantages in carding and spinning, which would pay a good return on the money.

"The question of card draft, which is by no means a decided fact, ranging from 90 to 130, was discussed at length, but the opinions were varied and we shall have nothing to offer at this time as to the proper draft.

"Beats per inch were next mentioned. From the fact that a large number of mills have reduced their beats per inch since we began these discussions, it is evident that the general opinion is for less beating.

"Setting of rolls is important for breaking strength, and while no set rule can be offered, other than the general practice of setting as close as possible not to draw uneven and make lumpy work, research may prove to us that definite standards above the staple length, when carried through progressively, may be better.

"Speeds of drawing rolls were discussed, and with no exception the lowest speed possible was advised, preferably not over 250 to 275." (A complete report of this Charlotte meeting of the carding division appears in April, 1927 COTTON, page 523.)

Results of Spinning Questionnaire.

Carl R. Harris, chairman, reported next for the Spinning Division. (A detailed report of this discussion will be found in May, 1927, COTTON, page 630.) In addition to reporting the meeting, Mr. Harris presented some interesting figures from a compilation of reports secured in answer to a questionnaire which gave reports on 68 different numbers of yarn, ranging from 6s to 80s. This compilation includes such information as twist, settings, speeds, gauge, length of traverse and stroke, etc., and is a valuable collection of figures on present practice. However, Mr. Harris read only a few items giving the comparative practice on several points that had been discussed at several meetings. For example:

"I find that 63.69 per cent of those reporting are using the No. 2 flange ring, 19.17 per cent the No. 1, .68 per cent the No. 1½, and 16.43 per cent did not give the flange. As the numbers being spun became finer the use of the No. 1 flange increased.

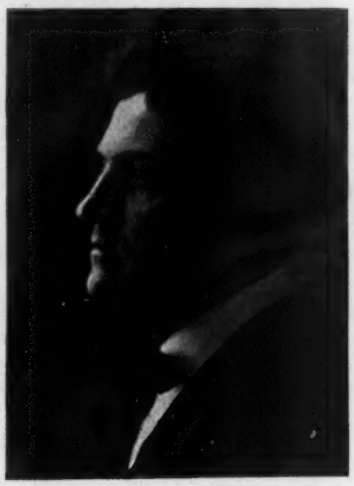
"The reports on the kind of wind being used for warp yarn were equally interesting. 52.38 per cent were using warp wind, 41.26 per cent filling wind, 4.76 per cent the combination wind; 15 per cent not reporting. On 30s warp 66.66 per cent were on filling wind.

"The study of speeds as given is interesting. There seems to be quite a variation in some cases, but, as a whole, it is surprising to note the regularity. There are just two cases that I would like to mention where apparently conditions are practically the same. In one there is quite a

wide variation, while in the other there is not so much.

"On 8s warp we have a variation reported from 144 r.p.m. of front roll to 200 r.p.m., with spindle speeds from 6,062 to 7,750 r.p.m. It will be interesting to note the standards for this number of yarn as given by three different manufacturers. One machine builder has a standard of 6,300 r.p.m. spindle speed, and 149 r.p.m., front roll; another 6,725 r.p.m. spindle speed, 160 r.p.m., front roll; and the third, 8,100 r.p.m. spindle speed and 188 r.p.m., front roll.

"On 30s warp, the speed of the front roll, as reported to us, varies from 108 to 120 r.p.m., and the spindle speed from 8,200 to 10,280 r.p.m. Three different manufacturers give the following standards: 9,500 r.p.m. spindle



W. H. Gibson, Retiring President.

speed and 116 r.p.m., front roll: 9,550 r.p.m. spindle speed and 117 r.p.m., front roll; 9,800 r.p.m. spindle speed and 120 r.p.m. front roll.

"It will be noticed that the front roll speeds on 8s warp vary 28 per cent from high to low and the spindle speeds 21.78 per cent. On the 30s warp the front roll varies 10 per cent from high to low and the spindle 20.23 per cent. On the 8s warp the manufacturers' standards vary 22.22 per cent for front roll and 20.74 per cent for spindles, while on 30s the variation is only 3.33 per cent for front roll and 3.06 per cent for spindles."

(Editor's Note: We have on file Mr. Harris' complete compilation of the questionnaire returns giving spinning details on 68 numbers ranging from 6s to 80s. Lack of space prevents its reproduction. However, any reader can secure the reports for any number upon request to us by specifying the number or numbers in mind.)

Reports for Weaving, Master Mechanics, Eastern North Carolina and Texas.

L. L. Brown reported next on the weaving division meeting held at Spartanburg on April 20th. This meeting was covered in June COTTON, page 771. L. O. Bunton read the report of H. H. Iler, chairman, for the Master Mechanics' Division meeting in Greenville on May 18th. T. W. Mullen, chairman, reported on the Rosemary meeting of the Eastern North Carolina Division, where spinning and carding were discussed. This meeting, held on May 6th, was reported completely in June COTTON, page 773. Robert W. Philip, associate editor, COTTON, reported for the Texas Textile Association convention, held in Waco, Texas, on May 20th and 21st. A complete report of the discussion at this meeting will be found on page 880 of this issue of COTTON.

For the past few years, the Association, in its convention programs, has endeavored to bring the manufacturing side, as represented in its membership, and the selling end of the industry into closer contact. This effort was furthered at this meeting by an address by R. G. Conant, of Wellington, Sears & Co., Boston, on the subject, "The Buyer's Viewpoint in Purchasing Goods, and the Selling Value of Quality and Uniformity of Product." Mr. Conant was the next speaker. His address in part appears upon another page of this issue.

"Human Relationships in Industry."

H. Gilmer Winget, of Gastonia, was the next speaker, having "Human Relationships in Industry" as his subject. After delighting the crowd with a few choice anecdotes, Mr. Winget took up his subject, speaking in part, as follows:

"It has been a splendid thing to get together in the sectional meetings and the general meetings for an exchange of ideas and to study the problems in connection with manufacturing as they relate to the machinery. I have often thought, however, that we have neglected to study, as groups, the problems of management of the human element. We are, to some extent, overlooking the im-

J. M. Gregg, Secretary-Treasurer.

portance of character building among our co-workers. I know that many are making individual efforts in that direction, and are accomplishing a great deal, and you are to be commended for it. I dare say that all of us who manage people are studying the problems incidental to the human element all the time, and as no two people are alike in every respect, no hide-bound, hew-to-the-line policies can be adopted, but an exchange of ideas in a sectional meeting for that purpose might help to improve both us and our co-workers. I believe that we should have a sectional meeting given over to the study of human relationships in industry, with its aim that of improving the morale of ourselves and our co-workers.

"The tripod upon which our industry stands consists of invested capital, management and labor. The human element enters into all three groups. Man created capital,

management assisted in this creation, and labor assisted both capital and management. When these three forces are working in unison they are an unbeatable combination. All three of the groups have certain responsibilities toward each other and the general public, who are all too often left out of the picture. Invested capital is entitled to a just return in the way of profits upon its contribution to industry. Management is entitled to good equipment and the respect and loyalty of the worker, enough character and loyalty in the worker to be willing to do an honest day's work for a days' pay. The worker, in return, is entitled to a living wage, a reasonably safe place in which to labor, well ventilated and well lighted plants, good living conditions, such as good houses, good schools and good churches, and a reasonable amount of recreation and amusement for himself and family. In the vast majority of the mill communities you will find that all of these conditions have been met, without any demand on the part of the worker. I am glad that there is no controversy between the groups here in the southland. Many of the so-called capitalists in the textile industry here in the South came up from the ranks of the workers and although successful, they have not forgotten their early struggles, and while they are in business to make money, they have no desire to pile up riches at the expense of the worker. It goes without saying that they are not in business for their health. The primary object is to make money. If they were in business for their health, they could come to Asheville and run a hotel and get both rich and healthy. By reason of the close contact of the three groups here in the South, there is sympathy and understanding and there is therefore no big problem to solve in connection with the human element, in so far as co-operation goes. A good feeling exists. You may acclaim from the housetops that there is no reason for sentiment or feeling in business, and yet it is true that business dealings between man and man are always accompanied by at least some sentiment. Here in the South we have a good deal of feeling for and towards each other and the result is that labor, management and capital have not adopted a cold-blooded attitude toward each other and all are striving towards the common goal of success.

"There is almost always room for improvement in any business but the textile industry itself is a monument to the spirit of cooperation of the three groups mentioned. As I have said, we have no outstanding problems and yet in looking around we can find some matters that we might consider for the welfare of the industry. For instance, the question of labor turnover is one of the costliest things we have to deal with today. I haven't the time to dwell on the reasons for this. It is a fact, however, that the breaking in of new employees generally cuts production to some extent and often the quality. I agree with you that there are times when you are most happy to part with some fellow who is pretty sorry, but as a general rule, you do not get a kick out of losing a good family. After a pretty thorough study of the causes, I am inclined to believe that the major causes are roving disposition, poor management of wages received, living beyond means causing debt and discontent, domestic troubles, illness, lack of ability, not properly encouraged, laziness and crime. The latter two go together as a rule. Irritable foremen and section men, a real or imaginary grievance and accidents. Most of these causes can be reduced by cooperation and education of foremen and workers.

"In closing, I wish to speak of the relations of accidents to the welfare of the human element in industry, both as to its effect upon labor turnover and decreased production, and also impress upon your mind that we have certain responsibilities concerning the education of the worker in preserving life and limb.

"If we are to obtain the very best results from a production standpoint, we must have workers that are careful about preserving their bodies from accident and unnecessay illness. The chief cause of accidents is carelessness and lack of concentration on the part of the person injured. We are told by those who make a study of accidents that 85 per cent of all accidents come about because of carelessness. Most textile plants have taken every reasonable precaution to prevent accidents by properly guarding belts, chains, gears, elevators and dangerous parts of machinery, but in spite of all the precaution taken, old man carelessness continues to take a large toll in maiming the worker. It is true that few fatal accidents take place in textile plants as compared with other industries. A

The Golf Tournament.

Despite unfavorable weather, the golf tournament of the Southern Textile Association was held on Friday afternoon, June 17th, on the Biltmore-Forest Course. The committee in charge consisted of W. W. Moore, Allis-Chalmers Co., Charlotte, Chairman; Fred B. Crowell, Edward H. Best & Co., Greenville; and Sam P. Rakestraw, National Gum & Mica Co., Athens. A number of prizes were offered, and presentation to the winners was made at the banquet on Friday evening by Mr. Rakestraw. The various events, and the winner in each, were as follows:

Low Gross Score (87)—Won by W. F. Woodward, Curtis & Marble Machine Co., Greenville, S. C.

Runner-up, Low Gross Score—N. H. Alford, Barber-Colman Co., Greenville, S. C.

Low Net Score—C. C. Dawson, superintendent, Cramerton Mills, Cramerton, N. C.

Runner-up, Low Net Score—Guy L. Morrison, Penick & Ford, Ltd., Greenville, S. C.

The prize for the longest drive was won by H. U. Baker, Acme Loom Reed & Harness Co., Greenville, S. C.

The prize given for the lowest score for six holes was awarded to Thos. E. Walsh, assistant business manager, COTTON, Atlanta, Ga.

South Carolina won the team prize from North Carolina, the only other entry. Greenville, S. C., supplied the winning team, consisting of Mr. Crowell, Mr. Woodward, Hext M. Perry, Detroit Graphite; and Fred Sails, "Textile World."

The seven prizes thus awarded were donated by the following associate members of the Association:

N. H. Alford, Barber-Colman Co., Greenville, S. C.; Fred B. Crowell, Edward H. Best & Co., Greenville; H. U. Baker, Acme Loom Reed & Harness Co., Greenville; John Humphries, Dary Ring Traveler Co., Greenville; W. W. Moore, Allis-Chalmers Co., Greenville; Hext M. Perry, Detroit Graphite Co., Greenville; Walter B. Pratt, Joseph Sykes Bros., Charlotte, N. C.; Sam P. Rakestraw, National Gum & Mica Co., Athens, Ga.; L. W. Thomason, N. Y. & N. J. Lubricant Co., Charlotte, N. C.; and W. F. Woodward, Curtis & Marble Machine Co., Greenville, S. C.

textile mill is a reasonably safe place to work and the majority of accidents are not serious and yet from the accidents that do take place there is quite a considerable amount of painful suffering and loss of time to the injured and his family and, in most cases, a decrease in production by reason of the fact that a new employee must be pressed into service to fill the injured one's place.

"We are told that in America, in round numbers, 25,000 people are killed each year in industry. This would be about 67 people per day. Two and one-half millions are injured in some form or other per year. We can hardly imagine the suffering caused to the injured families from

Carl R. Harris, Elected Vice-President.

the loss of the pay envelope to this great army of injured. And when we consider that 85 per cent of these accidents were due to carelessness, it is appalling. And when we realize that 85 per cent are preventable and should not be casualties, it seems to me that we should feel a keener responsibility towards the education of our workers to be careful.

"Aside from the humane side of the problem, we are also told that more than two billions of dollars are lost in wages and decreased production. If the foregoing statements are true, and I believe they are, then we have something worth while to do as overseers, superintendents and managers, towards the prevention of accidents. As I see it, it is a matter of education by word of mouth and example and in so doing to inspire the workers to put the proper value upon their life and limbs and realize their responsibilities and value toward their families.

"I know, of course, that nothing short of the millenium will stop all accidents. I know that there are chronics in the matter of accidents. There are those who are either on their way to or coming from an accident all the time, but I believe that alert overseers, section men and superintendents can greatly reduce accidents in the several plants by the proper effort and, in so doing, render a valuable service to humanity and to industry, both in the saving of life and limb and a waste of money.

"I believe, gentlemen, that we do not, as a rule, properly instruct the operative in the danger of lack of concentration of mind and the danger of carelessness. It would appear that self-preservation would prompt the worker to be careful, but statistics show that 85 per cent of them are not careful, and it is reasonable to think that if they had it sufficiently impressed upon their minds from time to time, they would feel their responsibility to their families and avoid accidents." Mr. Winget cited the case of a plant where, before safety work was conducted, there were 283 lost days during twelve months, and with the same plant doing safety work, the lost days were reduced to 51 within the next year. His address concluded the morning session. The afternoon on Friday was given over to a golf tournament.

The annual banquet was held at the Inn on Friday evening, with an address by Rev. J. W. Speake, of Spartanburg, as the feature. Dr. Speake, discussing cotton mill village conditions in a sympathetic way, pointed out the progress which has been made in the southern cotton manufacturing industry, not only in production and quality, but in the building of a civilization. The concluding feature of the banquet was a humorous demonstration of patented dinner implements by Mr. Weller, who amused the audience by showing caricatures of some of the leading lights in attendance at the meeting.

L. L. Brown, Chairman of Board of Governors.

Mr. Sloan Speaks on the Institute.

The Saturday morning session began with an address by George A. Sloan, secretary, Cotton-Textile Institute, Inc., New York City, on the work and aspirations of the Institute, with a view to "establishing a closer liaison between the Institute and the Southern Textile Association." Mr. Sloan was accompanied by Frank R. McGowan, textile engineer of the Institute, and the contact thus established between the Institute and the practical men represented in the Association will undoubtedly augur to the benefit of both organizations and the industry.

Mr. Sloan outlined the steps in the formation of the Institute, its organization thus far, and something of its plans. He touched particularly upon the matter of cost accounting since this, among the activities of the Institute, has perhaps the most direct bearing upon the work of the operating executive. Mr. Sloan's address was very well received, and the impressions made by both him and Mr. McGowan, in and out of the meeting, were commented upon favorably by many of the members.

Joe M. Gamewell, of Lexington, N. C., president of the

Cotton Manufacturers' Association of North Carolina, was the next speaker, describing in outline the recent flight of Colonel Charles Lindbergh, and the surrounding conditions, using this as an illustration of the advantage of research and study.

J. M. Gregg, secretary, made a comprehensive report of the Association's activity during the past year.

The next feature was the election of officers, with the results reported previously in this story. Mr. Gamewell next made the presentation of Arkwright Medals to the thirteen men whose tests had been approved by the research committee of The Arkwrights, Inc. The retiring president's medal was presented to Mr. Gibson by James A. Greer, following which the convention was adjourned.

Capitalism Versus Capital

BY LUTHER H. HODGES AND HARRIET L. HERRING.

The article below is one of a series which has to do with the fundamentals of business, or, more properly known as Industrial Economics. These articles are being published from month to month. Each one is a unit in itself, although forming an integral part of the entire series.

Practical mill men like practical material and these articles are designed to meet the needs of textile operating executives who are interested in knowing more about the laws governing business and industry. The entire series has already been used by a large cotton mill organization in the South in its educational work, and this organization found the material to be very practical and effective.

Each article lends itself to discussion by groups of mill men, as well as being helpful and interesting reading. Naturally the articles are brief and in attempting to cover this large field, only the most important points have been considered.

We are now going to discuss Capital as one of the factors in production. We mentioned previously that there were four main factors in the great scheme of production. These factors were land, labor, capital and enterprise. We discussed the function of enterprise in a brief way, but it will be taken up in more detail in a later study. We shall now consider the function that capital has in production.

Let us first consider what Production means in order to better understand its necessary factors and agents. We, in the textile mills, are so thoroughly used to the word "production" that we have perhaps never taken the time or the trouble to define it. Some people feel that only farming is productive and that all other agencies are merely contributory and can lay no claim to production. They further claim that only labor produces and, therefore, it should have all the rewards of production.

Production is the making or creating of some utility for the satisfying of human desires. The utility may not be just something from the farm, it may even be just a service rendered. Production is not the making of new goods or new matter—it is changing the form of matter. Suppose we consider the wool on a sheep's back. Through the various processes the wool is made into a blanket. That is a "form utility". The blankets which are made in New England by the thousands cannot be consumed in New England. The railroads enter into the production game by transporting the blankets to New York City or some other market center or place where they can be used. This is "place utility". But this may be done in the summer time or in a season when blankets are not in demand by actual consumers, so it is necessary that someone, either jobber or wholesaler, or someone else, hold the blankets until the consumer wants them, in other words until the right time. This is "time utility". All this is Production.

The creation of such utilities, though not fully appreciated, are nevertehless better understood than the production of what is known as "services", as given by teachers, doctors, lawyers, etc. The work of all these people is productive, for they contribute to the satisfying of human wants. In addition to these agents of production of services, we have, in our business world, the salesmen, jobbers, wholesalers, brokers, advertisers and others who help in getting the material "good" from the raw state to the final consumer. In proportion as these agencies really serve they are necessary parts of the producing machine. We want to now consider the part that Capital itself plays in production.

What is Capital?

There has always been so much confusion about the meaning of the term Capital that we might best try to answer the question—"What is Capital?" Oftentimes we hear and read the phrase, "Capital and Labor" when not "Capital" is meant but "capitalists", the owners of Capital. The private ownership of Capital is the real object of attack and we should certainly make this distinction. The capitalist is the owner of capital and he may be very important or very ordinary. A capitalist is generally thought of as some rich miserly man who is trying to increase his wealth at the expense of others. But the laborer in the plant who owns one share of stock is a capitalist. In America there are many capitalists although, as suggested before, we ordinarily consider our richest men to be our only capitalists. Capital itself has an entirely different meaning from capitalist, or the capitalist system, of which we shall hear more.

Capital is any product of past labor which is used to produce more goods. Capital is something that is worked for and then saved for the future. Money alone is not Capital, although many think so. Machinery is Capital, trains, cars and railroad equipment are Capital, the ditch digger's shovel is Capital, the typewriter in the office is Capital. They are all to be used for future production. Capital may be very small, may be very primitive. Mr. Laing, in "An Introduction to Economics", gave a simple illustration, " man can obtain a drink of water by dipping his face in a stream or by scooping up water with his hand. In this case his "labor" is direct. Each action brings immediate consumption. It is easier and more satisfactory in every way to use a cup. But a cup must first be made. The labor involved in making a cup is not expended for the immediate satisfaction of some desire. It is expended for the purpose of facilitating some future labor which leads to the ultimate satisfaction of the desire. Suppose the stream runs some distance from the dwelling of the man. Each time he wants to drink or to obtain water for any purpose he must go down to the stream taking his cup with him. If he wishes water for cooking he must go to the stream several times, each time bringing back with him some water in his cup. A little additional expenditure of labor will result in the making of a larger vessel which he may fill with his cup at the stream and save several

journeys. Still further, he may construct pipes leading from the stream to his house and save trips to the stream. With each of these tools or appliances the obtaining of water becomes easier and more satisfactory in amount. Appliances made for the purpose of facilitating production and not for immediate consumption we may term Capital."

This illustration serves to convey the idea of what Capital is and brings out clearly the distinction that the labor put into the cup, the vessel or the pipes was not to satisfy an immediate want but was labor expended for future use. Capital is the result of savings! If men do not consume all they produce, they are saving Capital. If the farmer saves seed from his crop, it is Capital. The savings of individuals from year to year represent their Capital. Savings of actual money are generally turned into material things such as machinery, materials, etc.

The Reward of Capital.

What is the reward of Capital? As we generally understand the use of Capital as practiced in the business world, it is so much money loaned to a firm or put in a business and its reward is known as interest. In other words, interest is the return Capital secures for its use. If an individual allows his wealth to be used as Capital instead of using it up immediately in an unproductive way, he will receive interest for the use of his Capital.

The question is raised by some people as to why Capital should receive a reward. If a man has money he will hold onto it for the present unless he is given a reward for its future use. It is natural to be skeptical of or undervalue the future, and a reward must be forthcoming if this risk of the future is taken. This reward is due the man. if he has saved his money by personal sacrifice or personal efficiency. If he received no reward, the incentive to save would be gone.

How Much Interest?

The amount of interest a person receives may be determined by the individual's own valuation of the future, or the community's valuation of the future, or it may take the form of the risk involved. With some risks a man might accept a low rate of interest, as from a savings bank or from government bonds, while he would naturally demand a much higher rate of return from cotton mill stock, for instance. Another element which influences the rate of interest is the eternal law of supply and demand. This is illustrated locally where money is tight and the demand great and loans of Capital easily demand 6 per cent or more, while in other sections of the country money goes begging at even 4 per cent. When the supply of Capital is great as compared with the demand for it, the rate of interest will, of course, be low, but when the demand exceeds the supply, the interest rate is high.

Where Does Interest Come From?

We have just discussed the fact that capital demands a return in the form of interest, and that this return may be governed by several different features. Where does interest come from to pay Capital its reward? Who furnishes it? Does Capital rob labor of its reward in order that it may secure interest? This is a view held by many. However, the scientific view held by students and men of business is that Capital creates its own fund from which interest is paid just as labor produces the wealth from which it receives wages. Interest is paid from this extra fund which Capital creates. By providing improvements on machines to increase production or to cut costs, Capital creates additional wealth and it is only natural that it should have a fair reward for this extra service. This reward comes in the form of interest. It was through the use of Capital that this extra fund was created and neither labor nor any other factor in production loses anything by this reward given to Capital. It often happens that the investment of Capital brings such great returns that, not only is a fair rate of interest paid, but labor gets increased wages and there are still surplus profits which go as an additional reward to the enterpriser for management.

Capital Renders Service.

Capital renders a distinct service in production. Things would be very primitive and conditions would be most intolerable if it were not for the service that Capital renders by aiding in the production for the future. If it were not for Capital, we would have to get our own bare necessities from day to day just as dogs and other animals do now. By what is known as "direct production" we would consume each day all we produce and would have nothing for the future. By the present methods of production, in which we employ Capital at all times, we plan and provide for the future. By our tools and equipment we produce more than we can consume and the surplus is Capital for future use or for trading for other goods. This is "indirect production." We work in the textile plant to produce clothing for other people besides ourselves, but we expect other people, through the use of Capital, to furnish us our shoes and hats, our food and fuel.

Capital increases production by providing for labor saving machinery and effecting other economies. It brings down the cost of articles to the people, through its manufacturing, transporting and distributing channels; it cuts the unit cost of all articles and satisfies human wants and human needs.

Capitalism Under Attack.

But, there is another side to Capital and the capitalist system which it, of course, develops. We suggested before that the criticism was prevalent that Capital's reward was questionable and that labor was the only factor in production and, therefore, should receive all the rewards. Some socialist leaders declare that the whole labor and socialist movement is essentially a revolt against the capitalist system. This may or may not be true, but the subject of this supposed conflict between the capitalist group and the laboring group is of increasing importance. As suggested before, the factors in production, whether capital or something else, must render a service, must have a purpose. One of the leading socialists of Great Britian said of industry, "An industry, when all is said, is, in its essence, nothing more mysterious than a body of men associated in various degrees of competition and cooperation to win their living by providing the community with some service which it requires—Because its function is service, an industry, as a whole, has rights and duties toward the community, the abrogation of which involves privilege—it should be subordinated to the community in order to render the best service technically as possible——, Those who render no service should not be paid at all." (Towney in "The Acquisitive Society.")

The author then proceeds to attack the capitalist system on the grounds that it is not functioning in giving service but in causing misery and unhappiness among the masses of the people.

In another book, "The Decay of Capitalist Civilization", the authors, Sidney and Beatrice Webb, arraign the capitalist system as follows: "The socialist indictment of the

capitalists system of industry, and the society based on it, has four main counts, History proves that whilst national poverty may have other causes, whenever and wherever the greater part of the population are divorced from the instruments of production, even where the aggregate production is relatively enormous, that the bulk of the people *live in penury and large numbers of them are perpetually threatened by starvation.* This penury and its accompanying insecurity are rendered more hideous and humiliating by the *relative comfort and luxury of the proprietory class and by the shameless idleness of some of its members*——. Thirdly, the worst circumstance of capitalism is the *glaring inequality in personal freedom* between the property-less man and the member of the class that 'lives by owning'——. Fourthly, the socialist believes that the very basis of the capitalist system is *scientifically unsound as a means of organizing the production and distribution of commodities and services,* and fundamentally inconsistent with the spiritual advancement of the race."

Briefly, these authors claim as a result of the capitalist system. 1. Poverty of the poor. 2. Inequality of incomes. 3. Difference in personal freedom. 4. Does not render proper service and is inimical to civilization itself.

Progress Due to Capitalism.

Even the socialist writers mentioned agree that it was only thorugh the capitalist system that the world has progressed and has secured the wants of life in abundance, but they claim that it is now being carried too far and that the inequality of distribution proves that. However, there has been nothing offered to the world that is quite as effective as the private ownership of Capital and a comparison of the countries where the capitalist system holds sway with those which have tried other experiments seems to show that we are on the right track.

Questions.

1. What are the factors in production?
2. What do we mean by "non-productive" pay roll? Is a Personnel Department productive. A plant newspaper? A company nurse?
3. What is the difference between Capital and Capitalist?
4. Is there a conflict between Capital and Labor? Explain.
5. What is your idea as to the solution of this very important problem of the capitalistic system?

The Buyer's Viewpoint, and the Selling Value of Quality and Uniformity*

BY R. G. CONANT.

WELLINGTON, SEARS & CO., BOSTON.

This subject naturally divides itself into two parts—first, the buyer's viewpoint in purchasing goods, and second, the selling value of quality and uniformity of product.

Speaking from a seller's viewpoint, buyers might be divided into two major groups, namely, those who put the question of quality first and those to whom price is the prime consideration. However, the aim of every buyer should be to buy the best goods and service at the lowest possible price. When we consider the viewpoint of the individual buyer we find it determined by his own characteristics, the personality of the seller, his particular needs, the value of the goods he is buying, the extent of the competition for his business, etc. In fact, a buyer's viewpoint may possibly change with every purchase and presents such a broad field for discussion that I shall pass it by except to say that I have found the average buyer to be a very reasonable individual, having a genuine desire to cooperate. As in all the relationships of life confidence plays a major part, so it does in the matter of buying and selling and in order to obtain the best results for buyer and seller there must be a feeling of mutual confidence.

The second part of our subject, namely, the selling value of quality and uniformity of product, is more our problem as manufacturers and sellers.

Permit me to quote a few paragraphs from Mr. M. D. C. Crawford's book entitled "The Heritage of Cotton":

"And so the world came to Paris in a stream of gold for the work of her masters. And France was wise, for no specious pleas of the advocates of serial production ever won her from her firm position. She kept her craftsmen and only experimented in a cautious manner with the machine. She gave security and honor and high rewards to her successful artists in all fields. She built schools and academies, workshops and museums to the end that this creative fertility might live and prosper.

"England and America, and indeed the entire industrial world, fed their hungry machines with the ideas that first saw perfection in France. So long as France created, the machine could not become sterile for ideas. France, for almost a century, has been the worlds' studio.

"If any valiant and patriotic manufacturer in England or America doubts this statement, let him study the list of professional buyers of style merchandise who sail on almost every steamer to the ateliers of Paris, or look at the labels on merchandise in Bond Street shops. If any lay reader believes these statements too strong in regard to cotton fabrics, they have but to go into the nearest department store and ask to see the cottons of Mr. Paul Rodier, artistic heritor of the great craft ages and international merchant."

I read that quotation not to extol foreign made goods but to stress the importance of superior workmanship and artistic effort as they relate to our problems as manufacturers.

It is interesting to consider the ever increasing use industrially of cotton goods. While no figures are available, it has been estimated that during the early history of the cotton manufacturing industry in this country probably not over 10 per cent of the square yards of cotton cloth woven were used industrially, as against possibly 35 per cent today; and if cotton yarns, twines and thread are included 50 per cent in pounds of total production would have to be listed as other than clothing and household fabrics. I speak of this changing situation especially as it calls for possible changes in our standards of quality. For instance, a sheeting which has been used domestically for

*An address delivered before the Southern Textile Association, at Asheville, N. C., June 17th.

generations may well meet the requirements of some industrial process as far as weight, construction and strength go, but in order that it may do the work satisfactorily special handling may be necessary in the cloth room. In this connection, I mention an experience that we had some months ago. We sold a customer several thousands of yards of one of our standard fabrics but he complained of the quality of the goods in the first shipment. The mill gave special attention to the quality of the next shipment, but again he complained and we despatched a man to investigate. He found that the goods were fully up, if not superior, to our standard quality. He investigated the use to which the fabric was put and discovered the answer to the problem. The mill had, as always, carefully burled the goods, but for this particular process they should not have been burled. We are now shipping this fabric with entire satisfaction to this customer and others for the same purpose, it being merely brushed and trimmed after leaving the loom. Hence, a grading standard for a fabric which was correct yesterday may be incorrect today as far as certain uses are concerned, and the burden is on the mill and seller to check carefully the changing factors and new requirements.

While quality and uniformity of product have always been demanded, modern volume production methods call for a very high degree of uniformity. Take, for example, cutting establishments. Many of you have doubtless visited some of the large garment manufacturing plants and have possibly seen 150 thicknesses of cloth laid out on the cutting table, the top layer bearing the pattern marks. With what rapidity did the electrically driven revolving cutter cut those thousands of yards into the proper shapes, and then how quickly did the sewing machines in the hands of skilled operators work those pieces into finished garments! In the olden days of largely hand labor an objectionable imperfection could be readily discovered and cut around, but today the chances of detecting it before it gets into the finished garment are necessarily much smaller. With competition keen with the garment manufacturers, seconds and all waste must be reduced to a minimum and uniformly good goods are absolutely essential to this end.

In an effort to produce uniformly good goods, are we giving the necessary attention to the cloth room? In laying out and equipping a mill, very careful consideration is generally given to the strictly manufacturing rooms with but little thought oftentimes to the location, size and equipment of the cloth room. As the cloth room is our last chance to correct, if possible, earlier manufacturing difficulties and to make final inspection of the goods, we should make the most of this opportunity to hold our standards of quality and uniformity. While urging the importance of the cloth room I am not overlooking the fact that seconds are not made in the cloth room—but are determined there.

I would like to speak for a moment on the question of put-up, which to my mind is a most important one and one closely allied with that of quality. How pleasing is the impression of a bale, for instance, well proportioned, burlapped, banded and stencilled, and if upon opening it the goods are carefully papered and the pieces neatly folded, stacked, tacked and ticketed or branded, that favorable impression is still further enhanced. While the man who opens the bale or case or handles the goods is generally not the man who actually does the buying, still his favorable criticisms may be very helpful and most assuredly his criticisms, if unfavorable, will be reflected in the buyer's estimate of the goods. Then, too, we must not overlook the importance of the put-up of the piece from the standpoint of the ultimate consumer who buys the goods over the counter. First impressions play a large part in our judgment of merchandise as well as men.

I would urge sellers to keep in close touch with buyers, not only from a strictly selling standpoint but with the idea of becoming better acquainted with their requirements and problems. Possibly some change in the width of a fabric would work out advantageously to the customer and not disadvantageously to the mill. I know that the wide bottomed trousers now being worn made slightly wider goods desirable. Perhaps some change in the put-up of a fabric would be wise. For example, I recall that some time ago we inquired into the question of discontinuing tacking a particular fabric and found that tacking, which had been done for generations on this fabric, instead of being wanted by most customers, necessitated the expense of cutting the tacking, and if the tacking were not carefully removed often caused a jam on a sewing machine. In other words, the mill was doing something which was not required by either it or the customer but instead was an expense to both. It is unnecessary to say that the mill quickly changed the fold, making tacking unnecessary, saved itself some money and better satisfied the trade.

While it is important for us to know well the needs and problems of the buyer, I have found it most helpful to acquaint the buyer with the intricacies and difficulties of cotton manufacturing by a visit to the mill. Invariably he has worked out to be a more reasonable individual and a better customer.

Permit me to stress especially two points with you men, as manufacturers; that is to say, after having settled upon a certain grade or class for a fabric we must adopt, first, a definite standard of quality within that grade or class and, second, we must then hold that quality as uniform as is humanly possible. Certain uses do not require the best and most expensive quality of goods and there are most assuredly definite outlets for some of the lower grades of merchandise, but there is no place in the industry for goods which are not of a uniform quality.

Although in this discussion we have given consideration to certain merchandising and manufacturing details not bearing directly on our subject, I trust we have not wandered too far afield. There can be no question that quality and uniformity of product are not only essential but absolutely necessary in merchandising goods to the best advantage. We have proof of it on every hand. Why do we as individuals trade with a certain store or have our clothes made by a certain tailor even though the prices may be higher than elsewhere? Because experience has taught us that their merchandise is good and uniformly so.

In closing, I cannot do better than to give that familiar quotation: "If a man write a better book, preach a better sermon, or make a better mouse trap than his neighbor, though he build his house in the woods the world will make a beaten path to his door."

The Cincinnati Milling Machine Co., Cincinnati, Ohio, is issuing a new booklet entitled, "Putting Quality Plus Into Cincinnati Standard Arbors," which may be secured upon application to the company.

Texas Mill Men Meet at Waco

BY ROBERT W. PHILIP.

The annual meeting of the Texas Textile Association was held in Waco, Texas, on Friday and Saturday, May 20th and 21st, and as usual attracted a representative attendance of superintendents and overseers from the mills of the state, who participated in a most interesting practical discussion of mill subjects, which will be reported in the following paragraphs.

Don D. Towers, agent, Worth Mills, Fort Worth, Texas, was elected president of the Association at the business meeting, succeeding J. G. Coman, of the Mexia Textile Mills, Mexia, Texas. Hugh S. Clarke, superintendent of the Miller Cotton Mills Division, C. R. Miller Mfg. Co., Waco, was made first vice-president, with A. L. Whetstone, superintendent, Dallas Textile Mills Division, C. R. Miller Mfg. Co., Dallas, as second vice-president. Dan H. Poole, superintendent, Sherman Mfg. Co., Sherman, was re-elected secretary-treasurer. Waxahachie was named as the location for the Fall, 1927, meeting.

Outside of the business pertinent to the association, the practical discussion occupied the major portion of the program. Following a visit to the Miller mill on Friday afternoon, the convention was opened by President Coman on Friday evening at the Hotel Raleigh. City Manager Adams made the address of welcome, and Robert W. Philip, associate editor of COTTON, Atlanta, responded for the visitors.

The only scheduled address of the convention was by Frank W. Gurry, of Charlotte, N. C., on the subject of "Cost Accounting in Cotton Mills."

Dan Poole, who at the last meeting was designated as the Association's representative to the Southern Textile Exposition and convention in Greenville, S. C., last Fall, reported briefly on various features of his trip.

Tests on Different Card Drafts.

Getting next into the practical discussion feature of the meeting, Mr. Coman, who led the discussion, started out with a question on card draft. The entire discussion followed closely a questionnaire of some twelve major questions, and most of the discussion consisted of reports on tests which had been made in each case by members previously assigned to the tests. The discussion was distributed pretty generally over the entire mill, ranging from the card room to the weave room, and some thought-provoking ideas were developed.

The first question, test on which was assigned to several members, was, "Make a test on cards to determine which gives best results—a draft of 90, 100, 120 or 130. In all cases keep the weight of the card sliver as near the same as possible, simply change the weights of the picker laps. Follow each of these through and make accurate tests to find which gives the fewest ends down on spinning, and the best breaking strength. If possible, run at least one week on each draft."

Mr. Coman was the first to report on this test. He said his overseer of carding took a great deal of care with it. "We used only three different drafts," said Mr. Coman, "which were 90, 102 and 118. We changed over four cards to each and kept them on for a week. We tried to keep a record of the humidity and found that it varied from 51 to 58 per cent during the tests. Our laps weighed 45 pounds for the 90 draft; 50 pounds for the 102 draft; and 58½ pounds for the 118 draft. The average card sliver for the 90 draft was 56.75 grains, with a high of 59 and a low of 55, or a variation of 7.05 per cent. On the 102 draft the average card sliver was 55 grains, high 56 and low 50, a variation of 10.9 per cent. On the 118 draft the average card sliver was 57 grains, with a low of 54 and high of 59, a variation of 8.77 per cent.

"On the drawing, for the 90 draft, the average sliver was 60.4 grains, high 62, low 59, or 4.96 per cent variation. On the 102 draft, the average was 59.2 grains, high 61, low 58, or 5 per cent variation. On the 118 draft, the average was 60 grains, with a 62 high, 56 low, or 10 per cent variation.

"On the finisher drawing, for the 90 draft the average sliver was 61.5 grains, 62 high, 61 low, a variation of 1.62 per cent. On the 102 draft, the average sliver was 62.5, 64 high, 61 low, 4.8 per cent variation. On the 118 draft, the average sliver was 62 grains, 63 high, 61 low, with 3.23 per cent variation.

"Up through this point, the lower draft has shown the least variation in weights, while the 102 and 118 drafts show practically the same.

"On the slubber, making a .53-hank roving, there was a variation, with the 90 draft, from 198 to 185, or 5.23 per cent, with an average of 191.25. With the 102 draft, there was a variation of 10 grains, from 198 to 188, average 193.5, or 5.16 per cent variation. With the 118 draft, the variation was 6 grains, from 198 to 192, or 3.1 per cent with an average of 194.5.

"This shows that the 118 draft gives less variation here with the 102 draft next and the 90 draft highest.

"On the intermediate, making a 1.23-hank roving, the 90 draft showed a variation of 6.7 per cent; the 102 draft a variation of 2.42; and the 118 draft a variation of 3.66 per cent.

"When we got to the spinning frame, we made quite a number of tests for breaking strength. We failed to keep an accurate record of the number of ends down, but we did make a very large number of individual breaks. Our yarn is 9½s. That made from the 90 card draft showed a variation of 5.7 per cent in weight, and 17½ per cent in breaking strength. With an average breaking strength of 200, ranging from 220 to 185. With the 102 card draft, the variation in the weight or number was 4.8 per cent, and 20.6 in the breaking strength, from 210 to 170. With the 118 draft, the variation in number was 8.55, and 19.8 per cent in breaking strength, from 211 to 172 pounds.

"According to the results in the spinning room we got the best results from a draft of approximately 102 and next best results from a draft of 90, and on the 118 showed the greatest variation in number, and not quite as much breaking strength as with the 102.

On the strength of this test, and other tests we have made, we have reduced our draft to approximately 98, and we think we are getting better results than we would with any other draft it would be practical for us to use."

"How many weighings did you take off of each card?"

asked C. S. Tatum, superintendent, Consolidated Textile Corp., Bonham, Texas. "About 24," replied Mr. Coman, "and we took about the same number right straight on through. We took these weighings every day right along with our regular weighings, and weighed about 24 each day."

"What grade of cotton, and what weight laps did you use?" asked Ben Edney, overseer carding, Belton Yarn Mills, Belton, Texas. "Our laps are approximately 52½ yards long," answered Mr. Coman. "On the 90 draft the lap weighed around 12½ ounces; 14½ ounces for the 102 draft; and 16 ounces for the 118 draft. The grade of the cotton is Strict Good Ordinary, our regular B grade mix, made up of West Texas and Oklahoma and some East Texas cotton, all blues and low grade stapling from ¾ to ⅞-inch."

Mr. Coman added that in testing his yarn, this was done at the same place in the build of the bobbin in each case, when the bobbin was about half-full. At this point, he brought out that the draft a mill is capable of running is determined to a certain extent by the local conditions. However, he said, in connection with "long" draft, he had recently noted in COTTON a man who wanted to know, "Why, when men use long draft on cards, don't they use a draft that is long? For years my drafts have been 215 inches in length. We never hear of a complaint on dirty yarn, and complaints of sizing are extinct." This reference was to an article on long draft by "Tom (Mass.)" on page 675 of the May issue of COTTON.

What's the Difference?

A member here asked the chairman to explain just what the difference in effect is between a long and short draft. In answering this, Mr. Coman explained that "in using a long draft, you must use a heavy mass of cotton—we use a 12-ounce lap with the short draft and feed it in pretty fast. Where you have a small mass of cotton and have to feed it in quickly, the action of the licker-in teeth is not as good on it as if you had a large mass of cotton, firmly held by the feed roll, with the fibers coming gradually out of that mass.

"The trouble I have experienced is that where you have such a large quantity of cotton, the settings are such that you damage the fibers rather than help them in pulling them out of the mass of cotton. I think we have found that a medium draft gives us better results than an extreme in either direction. If your cotton is held there long enough to allow the teeth to straighten out the fibers and is then delivered to the cylinder, you are getting better results so far as the carding is concerned."

The man asking the question stated he did so "because there is a doubt as to just what difference there is between the long and the short draft. There is no difference except the action of the licker-in. In the long draft you feed a heavy lap slowly. So far as the other settings of the card are concerned there is no change. The problem is whether the cotton is such as we want it to come in slowly. I think it depends on the grade of the cotton to a great extent. If you are working high grade cotton, a short draft is probably better, but with a lot of foreign matter in it a long draft is better. We did not make a test on that question except that we did change to 130 draft from 100, and we noticed that our stock was cleaner and we like it better. Then, too, along about that same time our breaking strength improved somewhat."

Mr. Tatum at this point emphasized the importance of accuracy in making the tests, as well as patience in carrying out a large number of experiments, in arriving at any conclusive result. Mr. Coman agreed with this, and Mr. Gurry expressed a word of caution to the men to take care in not accepting too literally the findings of some other mill; since the results and methods must be adapted and fitted for each one's local conditions. In connection with this discussion, Mr. Clarke of Waco declared that because of their interest and belief in experiments, and the need for accuracy, he has added to his staff a man whose duties consist entirely of making tests and following them through the mill; and, Mr. Clarke added: "I think he is paying us dividends."

Staple of Cotton.

Mr. Edney of Belton, and others, discussed here the influence of correct staple of cotton. Mr. Edney urged a closer cooperation between the grower and manufacturer to fill the latter's needs. "The time is here," he said, "when

Photo by Reid.
D. D. Towers, Agent, Worth Mills, Inc., Fort Worth, Texas, Who Was Elected President.

the cotton manufacturer and breeder should get together for a better understanding; the mill men are not laying enough stress on the importance of the breeding and raising of better varieties of cotton; that is, a cotton that would be better suited or of a better spinnable character than the average of today. It seems that cotton figures more than any other plant in the industrial development, and it does seem that the value from a spinner's standpoint could be improved by producing better varieties on a larger scale. Tests brought out by the Government experiment stations show how our mixed, degenerate and irregular fiber is produced; in every field of cotton off types or degenerate plants occur. These off types produce inferior, irregular fiber, as the hybridizing between normal plants and the rogues goes on, and then we have the crossing up of the varieties by insects, such as bees, etc. Other tests have shown that a most serious deterioration is brought about at the gins. This is bad where different varieties are planted in the same localities and mixed at the gins. Some of these gin tests showed seed following from the first bale as far as the second and third ginned thereafter. So it seems that we have a general mixture from the beginning

to the time the cotton is carried to the market. It is also easy to see that millions of bales of cotton are being produced throughout the belt that is of an inferior type. We might encourage a plan of community and one variety, as this would tend to produce a uniform fiber, which is just as necessary as a strong fiber. Too much stress has been laid on strength and not enough on uniformity of fiber. Two yarns could be of approximate strength, but far different in quality, due to one being of a uniform fiber, the other of irregular or mixed fiber."

Effect of Doffer Speed on Strength.

The chairman passed on to the next question, which was: "Make a test to show the effects in the resultant yarns when running doffers on cards at 10 r.p.m. and at 13 r.p.m. Note particularly the effect on breaking strength."

Isaac G. Moore, superintendent, South Texas Cotton Mills, Brenham, Texas, made the first report of this test. He prefaced his figures by stating, "I was glad to see the results I got were in line with some dope that Bob has been running in COTTON." In his test, he said, "the slow doffer speed was 11.1 r.p.m. and the fast speed 13.8 r.p.m. The yarn number was 12¼s. The actual number with the 11.1 r.p.m. doffer speed was 12.21s and with the faster doffer speed it was 11.74s; the difference between the two was a half a number or 5 per cent. The breaking strength of the 12.21s was 133.8 pounds, and the breaking strength of the 11.74s was 133.78 pounds. Of course, when you have a different weight yarn you must make a correction for the different weights. According to Draper's table of breaking weights for carded yarn, we lacked six pounds of having the standard on the 12.21s made with the slow doffer speed; and with the fast doffer speed the 11.74s lacked 11 pounds of coming up to standard." Mr. Moore said the tests were run right along together.

An overseer from the Houston Textile Mills, Houston, Texas, made the next report. "We made a 66-grain sliver, .42-hank slubber roving, 1.20 intermediate roving, and 10.25s yarn," he said. "We made this test all in one day, at three different times, under three different conditions of humidity, with the two cards running side by side. The first test in the spinning room was about 5 o'clock in the afternoon with 62 degrees humidity. The yarn made with the 10 r.p.m. doffer speed was 10.71s and broke at 128 pounds. With the 13 r.p.m. doffer speed, the yarn was 10.64s which broke at 134 pounds. The next test was at 8:00 o'clock in the morning, with 78 degrees humidity. On the 10 r.p.m. speed, the yarn was 10.30s, breaking 135 pounds; and on the 13 r.p.m. doffer speed, the yarn was 10.29s, breaking 131 pounds. The third test was at 11:45 A. M., just before noon, with 72 degrees humidity. The average number with the 10 r.p.m. on the doffer was 10.46s, which broke at 126, and with the 13 r.p.m. doffer speed the yarn was 10.36s and broke at 128 pounds."

The next test on this was from the Miller Cotton Mills at Waco, and was read by Mr. Manly, who made the test. "The cotton used in this test," he said, "was our regular warp stock, being composed of a mixture of bright and dark snaps with a good hard body and a staple of ⅞ to 1 inch. The cotton passes through a No. 4 bale breaker which is directly connected to a Saco-Lowell vertical opener with screen section apron delivery. From there it goes through a special cleaning trunk of our own design and is then carried overhead through a Saco-Lowell condenser hung to the ceiling of the picker room. The cotton is then run through two 40-inch Saco-Lowell two-section breaker lappers. Four laps are taken to a Saco-Lowell finisher with carding beater. These laps are run through the machine without changing the position of the cone belt, and three laps are secured for the test.

"Three cards were taken for the test. They had been ground within a week of the test and the clothing and settings were in good condition. The speed of the card cylinders was 168 r.p.m.; the licker-in, 465 r.p.m., and that of the doffers 10¼ and 13 r.p.m. according to the production gear used. The draft was 90. The cards were stripped clean and the laps put up at the back. The doffers were run at 10¼ r.p.m., until about half the laps were used. Then they were stripped clean and the doffer speed changed to 13 r.p.m. This speed was continued until the laps ran out.

"The resultant sliver was run through two processes of drawing and slubbers and intermediates. The next day the test was continued on through the spinning room, using a frame on 8s yarn with standard warp twist, 4.50 multiplier. The frame had a 2-inch ring, and 7½-inch traverse, filling wind. Cylinder speed, 1050 r.p.m. An attempt was made to check the number of ends down on the two kinds of stock, but so few came down that no record was made of it; the greater part of the doffs running full without any ends down at all."

As to results, Mr. Manly said that "Each bobbin of yarn was weighed and half a skein broken on a hand-power yarn tester. The yarn made from the stock carded at 10¼ r.p.m. showed an average number of 8.10s and an average of 205 pounds. That from the cotton carded at 13 r.p.m. doffer speed had an average number of 8.07s and an average break of 205.5 pounds. The stock carded at the slower speed appeared a little lighter due to the fact that the card had a little more time for the flats and licker-in to remove more impurities from the cotton. By careful comparison, there appeared no difference as far as evenness or cleanliness of the yarn was concerned. The ends run on the roving carded at the higher speed dropped a little more fly and broken leaf under the front rolls than the other stock did. On the grade and staple of cotton we use there seems to be no difference when running the doffers at 10 r.p.m. and at 13 r.p.m."

At the same time, Mr. Manly continued, he carried out a test on two different spinning frames. One was a regular Saco-Lowell 1920 Model, 2-inch ring, 7½-inch traverse. The other was a new Saco-Lowell, identical with the first except that the back roll is set further from the middle roll and the angle of the roll stand is increased and the distance between the bite of the rolls and the thread guides is considerably less. The frames stood side by side and the conditions were the same for both. Eighty bobbins of yarn were spun on each frame, forty being spun from the stock carded at 10¼ r.p.m. and forty at 13 r.p.m.

The results of this test showed with the 10¼ r.p.m. doffer speed, the newer frame with the inclined roll stand produced an average number of 8.10s with an average break of 208 pounds; while with this same roving the older frame gave an average 8.08s with an average break of 202 pounds. With the roving from the 13 r.p.m. doffer speed, the newer frame gave an average 8.07s with an average break of 208 pounds; while the average number on the older frame was 8.08s breaking 203 pounds.

Summarizing this, Mr. Manly declared that "on both kinds of roving used, the newer frame showed a uniformly increased break of five to six pounds over the old frame."

As a result of these tests, Mr. Coman declared that "it would appear there was no difference in breaking strength carding with 10 and 13 r.p.m. on the doffer. "Some of us have plenty of cards, but others have just a few," he said, "and while a lower speed will give us better results and cleaner yarn, it is not always possible for us to run the slow speeds and keep up. I think, however, we are getting away from the idea that we can expect a card to do good work at a high speed of production."

In this connection, Robert W. Philip was asked to read from COTTON the results of the Arkwright test of George F. Brietz on carding different quantities per card per hour. The results showed that carding 16 pounds an hour, making 26s yarn, the waste per spindle in the spinning room was 8.67 grains; the breaking strength was 60 pounds, with 60 ends down per thousand spindles per hour. Carding 12 pounds an hour, the waste mentioned was 6.80 grains, ends down, 59, breaking strength 69 pounds. Carding 8 pounds an hour the waste was 4.15 grains, ends down, 24, breaking strength 70.43 pounds.

Break Draft in Spinning.

"Make a two-week test on the spinning frame to determine what draft between the middle and back rolls gives the best results," was the next question on which tests were assigned. Reporting on this, Dan Poole, of Sherman, said that "on one test with 1.27 draft, we showed a breaking strength 13 pounds above standard; and another test with the regular 1.08 showed 10 pounds above standard. When we went above 1.27 the breaking strength began to drop. We did not go below the 1.08. These figures are from a test covering two weeks time."

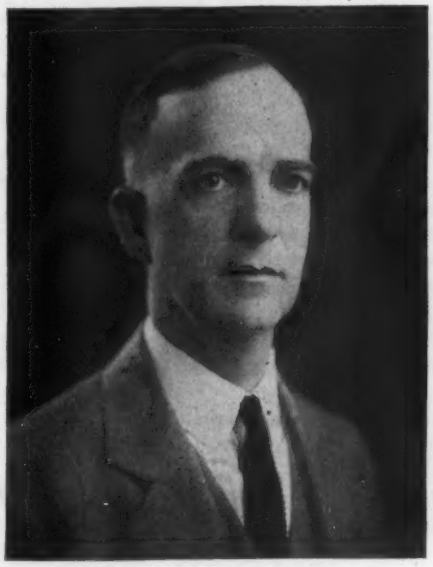
Grover C. Dilling, superintendent, Brazos Valley Cotton Mills, West, Texas, was next asked for a report. "Some seven or eight years ago," he said, "I went into that thoroughly, and I was never able to see where we could gain anything by going above the usual break draft, so we didn't make that test. There has been only one manufacturer that has put out a frame with more break draft on it, and if there was anything to it I think the other manufacturers would apply it to their machines, so I have never found any advantage in any more than enough to keep the roving coming straight between the rolls."

A report from Don Towers of Fort Worth on this was read, it stating that on 23s yarn, he had tried 1.08, 1.12, 1.16 and 1.22, and "we find that 1.08 gives the best results."

Mr. Tatum reported his test on this, stating that it covered a period of three weeks. Starting out, he said, he tried driving a 20-tooth gear with the 20-tooth, but found that it required at least one tooth difference, so he ran a 21-tooth, draft of 1.05; a 22-tooth, draft of 1.15; a 23-tooth, draft of 1.20; and a 24-tooth, draft of 1.25. So far as he could determine, from his tests, the breaking strength was "exactly the same," and "I reached the conclusion that if we were going to gain or lose anything by this it would take more than that, so we are having some gears made which will put it up to 26 teeth."

He repeated his former observation with reference to the effect of local conditions, declaring in this case that the length of the cotton had a great deal to do with a test of this character; also, he said, the middle roll has a great deal less weight on it, and this is a factor that has an influence. Theoretically, he said, the cotton should be drawn through and the draft increased more gradually, but according to his results there was practically no difference in the strength within the range he was able to run.

The test of Mr. Coman showed figures from drafts of 1.0186, 1.0418, 1.0649, 1.0880, 1.1112, and 1.1344, with a total draft in each case of 8.349, producing 9½s warp. All tests were carried on simultaneously, one side each of three spinning frames being used, tests made twice daily when bobbins were half full. The cotton used averaged ⅞-inch, from a Strict Good Ordinary blue mix. According to his figures, "it appears that a draft of 1.088 between the middle and back rolls gives the best results, using a total draft of 8.349, although there is very little difference in the results obtained between 1.04 and 1.09. The shortest draft



J. G. Coman, Supt., Mexia Textile Mills, Mexia, Retiring President.

used, 1.0186, gave a variation in number of 7.6 per cent, and a variation in break between 175 and 215 pounds, or 20½ per cent. The highest draft used, 1.1344, showed a 4.75 per cent variation in number, and a 31 per cent variation in break from 170 to 233 pounds. The draft of 1.0418 gave a number variation of 5.7 per cent and a breaking weight variation of 20.2 per cent. The draft of 1.0649 showed a variation of 5.7 per cent in number and 21 per cent in breaking strength, from 180 to 122. The 1.088 draft gave a number variation of 5.7 per cent, with a breaking strength varying from 182 to 213 pounds, or 15.7 per cent. The 1.1112 draft showed the number to vary 7.6 per cent, with a 33 1/3 per cent variation in the breaking strength, from 171 to 238 pounds."

One and Two Process Drawing.

The next question was dispensed with briefly. It read, "Make a two-week test to determine which gives best results in your mill, one or two processes of drawing. Try first by leaving the speed of the one process the same as when running two processes, then try it by reducing the speed 50 per cent and use all frames in one process."

The report of Mr. Towers summed up the consensus of opinion. It stated that "After trying one process of

drawing thoroughly, at 50 per cent reduction in speed we decided that two processes give us best results. One process gives us a better break in the yarn, but the unevenness was too excessive."

Ingram Lee, assistant superintendent, Dallas Textile Mills Division, Dallas, asked in connection with drawing if anyone in the state uses three processes, but no one answered affirmatively.

Four Versus Six Ends up at Drawing.

The last question reported on at the Friday evening session read as follows: "Compare evenness and breaking strength of yarn made from stock run on drawing with only four ends up on the back line and an approximate draft of four, producing the same weight sliver as normally; then take six ends of this stock and run through the finisher drawing in the usual manner. The proper draft gear to use for producing the same weight sliver, with only four ends up, is easily determined by indirect proportion: 4 is to 6 as the gear in use is to the one required."

Mr. Tatum was the first to report on this. "When we first tried this test we were delighted with it," he said. "For a long time we have been worrying our brains as to how to get the drawing sliver more uniform and even between the front rolls and the calender rolls. If you don't think it is full of thick and thin places there, you look at it when you get home and you will be surprised. Well, when we first made that change, and cut down on the draft, the sliver there looked almost uniform, but when it got to the spinning room it blew up, and there was fully ten per cent more end breakage from the sliver made with four ends up. The breaking strength averaged about the same, however. We put two frames on each kind of stock, arriving at the spinning qualities in that way. In other words, when we dropped down to four ends, there were fewer doublings and the end breakage increased at least ten per cent."

C. H. Megarity, night superintendent, Miller Cotton Mills, Waco, made the only other test on this question, but his figures did not include the number of ends down.

"We carried this test on through with our regular run of work," said Mr. Megarity. "The weather conditions were very favorable. The humidity in the card room was 50 and between 55 and 60 in the spinning room. We used Saco-Lowell four-delivery drawing frames, fluted steel rolls top and bottom. Front roll, 1⅜ inch, middle, 1⅛ inch. The card sliver was 55 grains. Drawing six into one, the draft of first drawing was 5.03, second 5.27. First drawing sliver 65 grains, second, 74 grains. The draft with four ends up on back drawing was 3.40.

"12x6 intermediates, 1 3/16-inch front roll; 1-inch middle and back rolls; draft, 4.22. 10x5 intermediates, making 1.30-hank roving. 1 3/16-inch front roll, 1-inch back and middle rolls; draft, 5.40. The spinning frames were tape driven, warp, filling wind, using a No. 2 medium McMullen spindle, 3½-inch gauge, round-nose bobbin, 1⅛-inch whirl; 8-inch cylinder, 2-inch rings, No. 2 flange, steel rolls, front 1-inch, middle and back, ⅞-inch; leather top rolls, all 15/16-inch. The cotton used was bright snaps, firm in body, ⅞ to 1-inch staple.

"I will report the extreme variations in grains:

	Six Ends Up	Four Ends Up
First Drawing	63 to 69	62.5 to 67
Second Drawing	73 to 75	73 to 75
Slubbers	207 to 216	206 to 215
Intermediates	78 to 80	77 to 80
Spinning	8.26s to 8.55s	8.26s to 8.25s
Spinning	8.82s to 9.35s	9.01s to 9.35s
Spinning	11.90s to 12.82s	11.98s to 12.66s

	Six Ends Up	Four Ends Up
Avg. Number and Breaking Strength	8.47s, 210 lbs.	8.45s, 207 lbs.
Avg. Number and Breaking Strength	9.13s, 187 lbs.	9.17s, 187 lbs.
Avg. Number and Breaking Strength	12.28s, 132 lbs.	12.36s, 129 lbs.

"As a result of this test, we find that four ends up on the back drawing instead of six does not materially affect the breaking strength or evenness of the yarn."

This practically concluded the Friday evening session. C. B. Bagley, head of the textile department of Texas A. and M. College, at College Station, and President Coman, discussed means for improving the staple of the cotton grown in the state.

The Life of Roller Cots.

The convention re-assembled on Saturday morning at 9:30 o'clock, and the practical discussion of the questionnaire was resumed. The first question presented by Mr. Coman was: "How many cots per spindle per year do you average using? Make a test and report the results, giving the yarn number in each case."

Herbert A. Burow, assistant agent, Postex Cotton Mills, Post, Texas, said that, "We ran that test, although before we got the questionnaire we hadn't kept an account except through the number of skeins. We only got a test on that over a thirty day period, and our figures show that in thirty days' time we used 500 rolls on our filling, and 640 rolls, or pairs of rolls, on our warp. That was on 11,520 spindles for thirty days. We have 52 frames, 104 sides, which would make that about three rolls per side per week." He runs 21s warp; 25s filling.

Mr. Towers' report on this, read in his absence, showed his figure to be 1.48 cots per spindle per year.

Ingram Lee reported on this question for the Dallas Textile Mills as follows: "In the three weeks we had for this test, it was impossible for us to give any sort of accurate information as to the number of cots we use. Furthermore, our invoices for roller covering for the past year are inaccurate, as we have increased our spindleage about 50 per cent in the past nine months. However, we have tried to get together a little information from which we have made some theoretical computations as to the number of rollers we might be using.

"For 14 days and nights we have kept exact account of the number of rollers used on our 44 warp frames. This means 14 days of ten hours each and 14 nights of 11 hours each actual running time, not counting the time we have stopped our spinning. In this time, 294 hours, we used 965 rollers. In 1927 there are 275 days and 250 nights during which the mill will normally operate, making a total of 5,500 working hours. The figures given showed us that we use 3.25 cots per hour or about 32 cots per day for the whole room. To find the cots per spindle per hour we divided by the number of warp spindles, or 10,032. This gives .00032 cots per spindle per hour, and for a year of 5,500 working hours this would give 1.78 cots per spindle per year. In other words, if we operated our full spindle capacity for the full year, using rollers at the rate we have used them for the past three weeks, we would use 1.78 rollers per spindle per year. As a matter of fact, we operate our warp spindles only about 85 per cent of the time the weaving runs, and on this basis we would use 1.52 cots per spindle per year. Our average warp yarn number is 16.09s."

On 9½s, Mr. Clarke reported an average of 1.75 cots per spindle per year.

Reporting for Mexia, Mr. Hollingsworth, the overseer of carding, gave the results of a test on the number of rolls used over a period of eight months. On 3,456 spindles or 32 sides on 9½s warp yarn, he used 3,263 rolls, or 102 per week, giving an average of 3.83 per side per week. On 5s to 14s filling, 1,412 spindles or 14 sides, he used 1,054 rolls, 33 per week or an average of 2.36 per side per week. On 1.25-hank intermediate roving, he has 624 spindles or 6 sides, and used 766 rolls, or 24 rolls per week, giving an average of 4 rolls per side per week. On .53-hank slubber roving, he has 240 spindles, or 4 sides, and used 598 rolls, making 19 rolls per week, or an average of 4¾ rolls per side per week. In these figures, shells are counted as full rolls for intermediates and slubbers.

E. L. Sord, overseer, spinning, Brazos Valley Cotton Mills, West, Texas, reported a system of keeping a record of every roller as to the spinner using it, and when any one spinner's consumption of rolls becomes excessive, he goes to her and explains the expense of the rolls and roll covering, etc.

In answer to a question from Mr. Clarke, it developed that most of the men present use a sheepskin covering over a tweed or all-wool cloth. Mr. Coman asked if anyone had tried using a calf-skin. "I am trying it out now," answered Mr. Clarke. "So far I like it all right, but I have not gone into it enough to thoroughly sell myself on it yet. The biggest difficulty we have is that it is very difficult to get a good smooth lap, but after a good lap has been obtained I find that the roll will not scuff up and that it will not flute, whereas 25 per cent of my sheepskin rolls will flute and get roughed up."

The president next asked for the roll speeds and yarn numbers of the men reporting on this section. They were given as follows: Mr. Burow, 126 r.p.m. on 21s warp; Mr. Clarke, 185 r.p.m. on 9s warp; Mr. Lee, 160 r.p.m. on 14½s warp; Mr. Hollingsworth, 136 r.p.m. on 12½s filling and 162 on 9½s warp.

Mr. Coman expressed here the belief that the speed of the front roll influenced the use of cots to a large extent and "I think we must consider that when we are figuring how many rolls we use."

Asked for a report from Sherman, Mr. Poole said, "We have a record for the last five or six or eight years, but we do not pay any attention to the number of rolls that a spinner or the frames uses per day or week. We have kept up with the cost, the total cost, of the rolls for the spinning room, and our records show that our cost is 12 to 16 cents per year per spindle."

Causes of Loom Stoppage.

The next question took the discussion into the weave room. It read: "Make a two-week test in the weave room to determine all causes for loom stoppage. Suggest you assign this job to a competent person who does nothing else but make the test, and recommend that a different set of looms be tested each day."

In replying first to this question, J. V. Hunt, overseer weaving, Brazos Valley Cotton Mills, West, Texas, said he felt, in order to make the results comparable, that the reports should be made on the basis of the stops per one thousand ends. He read a report for a 29-inch, 10-ounce B grade duck, covering 110 hours, using an 18 reed, 9½s warp and 3½s filling. The stops, per 1,000 ends, coming from *Broken Warps,* were distributed among the various causes as follows: Knots, 19; gouts, 6; loose ends, 5; unknown, 7. From *Broken Filling,* Caused from loom, 4; Caused from spinning, 5; unknown, 10. From *Loom Out of Fix,* Filling run out, 2; slam off, 1; unknown, 1. For one loom, with 2,000 ends in the warp, Mr. Hunt pointed out that twice these figures would be the result.

Reporting on stops per 1,000 ends on a 34-inch, 16-ounce, A grade duck, 22 reed, 9½s warp, 3½s filling, Mr. Hunt gave the following figures: *Broken Warps,* knots, 20; gouts, 5; loose ends, 4; unknown, 6. *Broken Filling,* Caused from loom, 2; Caused from spinning, 7; unknown, 4. *Loom Out of Fix,* Filling run out, 1; slam off, 1; unknown, 2. The same method of reducing these figures to the number per loom by multiplying by the number of ends in the warp could also be used here, Mr. Hunt explained.

Mr. Poole of Sherman made the next report. This was for twenty-four 40-inch Modified D Draper looms, running on 40-inch, 11-ounce duck, with 2,988 warp ends, 9.60s warp and approximately 6s filling. The test covered a period of 55 hours, and included all stops for whatever cause under the various classifications. The figures were: Filling broken, 260; gouts, 57; draw backs, 61; filling broken on change, 32; stopped on change, 100; loose ends, 56; slack ends, 18; slam, 27; warp out, 28; flagged, 48; empty quills, 11; broken ends, 226; knots, 38; miscellaneous, 281. *Total*: 1,243. "This," said Mr. Poole, "shows an average of 226 stops per day on 24 looms, or an average of 9.4 stops per loom per day of ten hours, or less than one stop per hour per loom."

Hugh Clarke next reported. "In making this test," he said, "we assigned to the job a good loom fixer in whom we had absolute confidence and we made sure that he understood our purpose in running the test. A week's test was run on each of three sets of looms of twelve looms each for a 55-hour week. The looms were Model E, 30-inch Draper automatic, and directly driven by individual motor. The warps used were our standard indigo-dyed denim warps of 2,024 ends spread on 29½ inches of reed space, one week on 8s yarn and two weeks on 9s. The following results are expressed in the number of stops per loom per ten-hour day: Gouts in warp, 21.20; gouts in filling, .62; loose ends in warp, 21.30; slip knots in warp, 1.00; weak ends, 20.50; stop offs, .68; slam offs, .13; bad filling, 1.87; filling breaks on change, 1.53; bad knots, 1.98; loom out of fix, .21. *Total*: 71.02 stops per loom in 10 hours, or an average of one stop on every loom every 8½ minutes."

The next report came from Mr. Tatum, who said it was based on 40-inch Stafford shuttle-changing looms. He pointed out that he did not record stops that the looms made to change filling, since the looms were without feelers and the filling ran out. Mr. Tatum included in this report comparison between loom stops with warps treated with pearl starch and warps treated with thin boiling starch. This test covered a period of four days in each case. Taking first the thin boiling starch (converted with Arey) warps, he found the following for that period, using in all 50 looms, a different number each day: Motes, 5; gouts, 82; spooler knots, 25; kinks with knots, 11; kinks without knots, 8; weak yarn, 63; pull offs, 3; slam off, 10; strings, 10; making a total of 236 stops, or an average per loom per day of 4.7 stops. On the warps made with regular pearl starch, he found: Motes, 1; gouts, 23; spooler knots, 6; kinks with knots, 6; kinks without knots, 4; weak yarn, 35; pull off, 1; slam off, 1; strings, 1; a

total of 78 stops. Fourteen looms were used in different numbers throughout the four days, giving a total average stops per day per loom of 5.5. Mr. Tatum called attention to the weak yarn item, which, he pointed out, was the only cause of stoppage listed which would be affected by the kind of size applied. He pointed out that the stops from this cause with the converted thin boiling starch was 1.25 stops per day, while with the regular pearl thick boiling starch, the average was 2.50 or exactly twice as many when using the thick boiling starch.

Mr. Booth, overseer of weaving, made the following report for the Mexia mill. "Our test extended over a period of one week, a different ten loom set being used each day. A relative humidity of from 65 to 80 per cent prevailed, there being approximately the same variation in this respect each day. Looms on the same warp numbers were used, sized to approximately 12 per cent, actual dry weight addition. The warp was 9½s with 4.3 times the square root of twist. Following are the figures for the total. Unknown causes, 7; knots, 33; kinks, 18; gouts, 48; draw backs, 1; filling breaking on change, 149; filling breaks while running, 151; filling running out, 34; loom out of fix, 21. In checking each loom we find some looms ran without a stop during the test while others stopped frequently."

Varnishing Top Rolls.

The next question asked for the effect of varnishing top rolls in spinning on the amount of top clearer board waste and the evenness of yarn. Mr. Coman was the only one to answer this. He said that "we have been varnishing rolls ever since the mill started up, and Mr. Hollingsworth, our overseer of carding, ran a ten-day test on 24 rolls that were varnished against 24 that were not varnished. He put them on opposite sides of the same frame, cleaned all his spindles and idlers and saw that he had good middle and back rolls. His figures show that all clearer board waste removed in ten days from the 24 unvarnished rolls was 1,209 grains, and the amount taken from the 24 varnished rolls was 1,334 grains. We do not varnish our new rolls, but we do varnish rolls taken out for any cause, if they are slightly worn and still good enough to run a while as back and middle rolls. We decided some time ago that varnishing the new rolls was not satisfactory; that is, with the varnish we are using."

Thin Versus Thick Boiling Starch.

The ninth question in the questionnaire asked for comparative increase in breaking strength between pearl starch and thin boiling starch.

Mr. Tatum said that "we ran five tests with the pearl starch and five tests with the thin boiling. I might state in the beginning that the thin boiling starch was obtained by treating pearl starch with Arey at the mill. In making this test we took four bobbins, sized and broke them, twelve breaks from each bobbin and averaged them up, and ran them onto spools, and then ran the spools through the slasher, and reeled them off and broke them again. In that way we thought we got it as accurately as possible.

"Taking first the pearl starch, we used 125 pounds of starch and 50 pounds of compound to 200 gallons. The first test showed that we added 13 per cent size, and 27.2 per cent strength; the second, 3.6 per cent size and 16.4 per cent strength; the third, 8.4 per cent size and 17.7 per cent strength; the fourth, 7.8 per cent size, and 9.6 per cent strength. The fifth, 8 per cent size and 17.8 per cent strength. This gave an average of 8.1 per cent size added and 17.7 per cent added strength.

"With the thin boiling, the first test added 7 per cent size and 16.9 per cent strength; the second, 6.5 per cent size and 22 per cent strength; the third, 5.7 per cent size and 23 per cent strength; the fourth, 11 per cent size, 20 per cent strength; the fifth, 4.4 per cent size and 17.4 per cent strength, making an average of 6.9 per cent size and 19.8 per cent strength added. The slasher was run at 40 yards per minute, 21s warp, in both cases.

"I want to say that these records of increased weight added by the size, as we found on the single strands of yarn we ran through as mentioned, did not agree with what we were getting in figuring the percentage added to the set. While these tests were being run we were getting on the whole set about 13 per cent with the pearl starch and 15 to 16 per cent with the thin boiling.

"Our figures show that on the thin boiling, the average strength added was 19.8 per cent, which is two per cent more than the thick boiling. Furthermore, as I said, running the two warps in the weave room showed twice as many breaks in the loom with the thick boiling more than the thin boiling."

Mr. Tatum also reported the test of W. S. Morton, superintendent, Dallas Cotton Mills, who was not present. This showed that the thin boiling starch showed an increase in weight of 9 per cent and 26 per cent increase in breaking strength; that the thick boiling showed an increase in weight of 9.8 per cent and 12 per cent increase in strength, the slasher running at 31.72 yards per minute. His set weight figures showed an increase of 11.8 per cent with the thin boiling and 12.7 per cent with the thick boiling.

Ingram Lee made the following report for the Dallas Textile Mills: "Twenty bobbins of yarn were taken off of ten different warp frames, care being taken in each case to get bobbins half full from roving bobbins also half full. In this way we avoided chance of stretched roving which would weaken the yarn; also since the yarn is pulled tightest when the traverse is at the top, we selected bobbins where the traverse was at the middle with the pull about average. These bobbins were put in the reel and one skein wound from each. Each skein was broken and weighed, and the average taken. The yarn averaged 69.90 grains, or 14.31s. The breaking strength was 121.3 pounds.

"These twenty bobbins were spooled on four spools and put in a creel behind the slasher running at the rate of 27.69 yards or 83.07 feet per minute, with thin boiling starch in the size kettles. A reel was placed in front of the slasher, the four ends were leased out on top of the warp and led to the reel. Twenty skeins were reeled off as before. Whenever the slasher was stopped to remove a reeling the ends were broken and run long enough to get past the part that had stood on the cylinders before a new reeling was started. In this way, the slasher was stopped only a few seconds to tie the ends to the reel. These skeins were weighed and broken in the Scott machine and gave an average weight of 77.93 grains, and a break of 151.5 pounds, average number, 12.84s.

"With the same spools and a slasher speed of 26.28 yards per minute (78.84 feet) the test was repeated using a thick boiling pearl starch. The average weight obtained was 77.52 grains with a break of 153.1 pounds, average number 12.90s.

"The moisture content of each was found with an Emerson oven, using the average of four skeins in each case. Mr. Towers of Worth Mills kindly made this test for us, as we had no conditioning oven.

"To find the percentage of size remaining in the cloth we took the weight of a full beam of yarn run at the same time as the four ends. All waste was weighed, all the filling and all the quills, weighed back and subtracted. The per cent size in the warp was figured from the difference in weights of the four ends. Of course, we had to assume that the entire beam had the same per cent size as the four ends, which was not strictly true. However, being run at the same time it was a reasonably safe assumption.

"Thus with the thin boiling starch, we found an increase in weight of 11.48 per cent and 24.9 per cent increase in breaking strength. The increase in moisture content was 1.14 per cent. The per cent lost in weaving was 1.28.

"With the thick boiling starch, the increase in weight was 10.9 per cent and the increase in breaking strength 26.2 per cent. The moisture content was increased 2.81 per cent. There was .65 per cent lost in weaving."

Figures on loom stoppage between the two warps also were given by Mr. Lee. This test covered 85 hours, with 2,300 ends in each warp. The stoppage on the two warps was as follows: Broken warp threads: thin boiling, 15; thick boiling, 19; broken filling threads: thin boiling, 30; thick boiling, 25; slack warp: thin boiling, 1; thick boiling, 1; out of fix: thin boiling, 9; thick boiling, 2; bad quill: thin boiling, 1; warp kink, thick boiling, 5. The size formula used was: 115 pounds starch; 15 pounds compound; 8 pounds special sizing gum; 5 pounds beef tallow; 106 gallons of water; cooked for one hour at 210 degrees F., 8 pounds of steam on slasher drums. Hard water containing considerable alkali used for size mixture.

"We ran two weeks on pearl starch, but we had more breaks in the warp," said Mr. Coman. "Of course the beam weights were practically the same as with the thin boiling and we used about 20 to 25 per cent per mix less pearl starch than we used of thin boiling. At the present time we are using a mixture of pearl and thin boiling and so far are very much pleased with it." Mr. Coman added later that he uses a distilled water for making his size, saving the condensate from his slashers for this purpose.

"The last time I was in Georgia," said Mr. Tatum, "I was interested particularly in the life of harness, and I visited a number of the best mills over there and two mills making good records in the way of production told me that they were using pearl starch and they found it was very much better than the ordinary acid treated thin boiling starch and that they got very much better life out of the cotton harness using the pearl starch. It is hard for me to believe that statement in comparing the thin boiling and pearl starch. I can tell the difference of the warps in the dark. I cannot see why a rough warp wouldn't wear out the harness quicker than a smooth size."

"I think I can throw a little light on that," offered Mr. Clarke. "You can put cotton in a strong alkaline solution and it will not hurt it, but in an acid solution it is gone right now. The mills you mentioned are absolutely right. However, we use a thin boiling starch. Our warps are practically all indigo dyed and indigo dye is strongly alkaline, and the acidity of the starch is not sufficient to offset the alkali of the dyestuff; therefore, we do not have that bad effect on the harness. To offset the effect of the alkaline dye on the wool slasher cloth we are very particular to wash the indigo warps before they go to the warp dryer."

P. G. Wear, representative of Penick & Ford, Ltd., starch manufacturers, was asked to discuss this, and declared that in his opinion the acidity in the pearl and thin boiling starch would be the same. It must be neutral, he pointed out, and such acidity as is in the thin boiling is not that which is used in converting it.

"I believe I can say a word," suggested Mr. Hunt. "A few years ago you didn't hear very much about the harness question. A few years ago there weren't many people on thin boiling starch. I believe the thin boiling starch has caused most of the harness trouble. I believe thin boiling starch gives the best results, but I believe it is much harder on cotton harness than the pearl starch."

"Why?" asked Mr. Coman.

"It has more of a knife and cutting effect," replied Mr. Hunt.

"We have sent off quite a few samples of sized yarn and had micro-photographs made of them," said Mr. Coman. "I believe you will find in practically every instance that a thin boiling starch goes into the fibers while with the pearl starch there is more on the outside. Whether that is due to the fact that we do not boil our starch enough I do not know, but you can feel a warp sized with a pearl starch and there is no question but that it is very much rougher. If you are using the same amount of pearl in the mixture as you did thin boiling, it seems to me that the thin boiling starch should be easier on the harness because instead of having only the fibers working on the harness with the pearl starch you also have the coating of starch." He added that he does not use cotton harness so he cannot observe the effect in this connection.

The results of a weaver's knot in the loom were next discussed briefly. Mr. Coman, and J. O. Wilson, Supterintendent, Guadalupe Valley Cotton Mills, Cuero, Texas, reported excellent results. Several of the others declared they had been unable to apply the hand knotter successfully and train the help to tie the true weaver's knot all of the time.

Pure Tallow Versus Compound.

The final question from the questionnaire was: "Can better results be secured by using sizing compound or a high grade of pure ordinary tallow?"

J. O. Wilson was first called upon. "I haven't used tallow in the past 18 years," he said. "When I did use tallow, if I could get a good pure tallow I had mighty good results, but at that time we were making sheetings, and since I have been on duck I find there are some compounds on the market that give us mighty good satisfaction."

Mr. Clarke said he had tried many different compounds, but had been unable to get the same result as with a good unedible tallow which he purchases locally. The compounds, he said, would vary in consistency from one shipment to another. He said he uses tallow with a little paraffin wax. He said, however, that he was not knocking any of the compounds, and had tried to be fair to all, but his best results came from tallow. His warps are mostly indigo dyed, and, he said, "indigo dye is not a penetrating dye, it is just a coating, and it is very hard to get the size to penetrate, and if we put a gum in there we couldn't get the penetration. According to my experience you cannot

use a gum on indigo warps."

Mr. Burow reported the use of tallow at Post.

Ingram Lee made the following report for Dallas Textile Mills. "We made twenty weighings and breakings from half-filled bobbins where the roving bobbins also were half-full. Our average weight was 69.25 grains, or 14.44s yarn. The average break was 130.5 pounds. This yarn was spooled and set in a creel. On the first run we used our regular size mixture, except that we entirely omitted all tallow. (We usually run about five pounds of tallow to each kettle in addition to the compound and gum.) The four sized ends were reeled off as before and the average weight was 73.25 grains or 13.56s yarn. The average break was 152.6 pounds.

"With the same spools and as near the same slasher speed as possible, we made another run using pure beef tallow, glycerin and a little sizing gum, but omitting the compound. The resulting average weight was 73.70 grains or 13.57s, and the average break was 134.5 pounds.

"In addition to this we made a complete size test, not on the four ends alone, but on the entire set of 15 loom beams. The section beams were weighed on the back and the net weight of soft yarn noted. The loom beams were weighed, empty and full, off the slasher front, and the weight of the sized yarn noted. All waste was weighed. From this data we computed the actual percentage of size we put in each set. This varied considerably from the results shown by using only four ends, and we assume that this must be a much more accurate method of determining the percentage of size.

"Fourteen warps sized with the compound and a similar number sized with tallow were tied in the looms and stoppages on each recorded. One warp of each set was followed through to the cloth room to observe the amount of size beat off."

Mr. Lee's figures showed that with the compound mix mentioned, the increase in breaking strength was 16.9 per cent; on the four ends, there was 5.78 per cent size added; on the entire set, 7.96 per cent. The moisture content was increased 2.80 per cent to 7.29 per cent. There was a loom loss of 2.26 per cent.

With the tallow mix, the increase in breaking strength was 3.1 per cent; on the four ends there was 6.43 per cent size added; on the entire set, 10.8 per cent; and an increase of 1.29 per cent in moisture content to 5.78 per cent.

The composition of the mixtures was as follows: *Compound Mix*: 115 pounds Eagle Finishing Three-Star corn starch, 20 pounds compound, 8 pounds special sizing gum, 100 gallons of water. *Tallow Mix*: 115 pounds Eagle Finishing Three-Star corn starch; 20 pounds beef tallow; 8 pounds special sizing gum; ½ pint glycerin; 100 gallons of water. Both mixtures cooked for one hour at 210 degrees Fahrenheit.

The figures on loom breakage showed that in 70 hours the warp sized with the compound mix broke 26 times per loom, and the warp from the tallow mix broke 16 times per loom. These figures being the average of 14 looms each for 70 hours run.

Mr. Tatum brought out that comparative tests could not be considered conclusive unless the constituency of the compound being tested against the tallow mix was known, and Sam P. Rakestraw substantiated this idea.

Mr. Coman stated that "We use a compound. I have tried out tallow and several different compounds, and the compound we are using now we feel like gives us the very best results."

What Causes Gouts in Yarn?

This discussion completed the prepared set of questions, and Mr. Tatum asked one. He wanted to know what made the gouts in his yarn. He said he had been able to cope with what he called "monkey-tails"—hanging down between the clearer and the front roll—by having a girl learner use a brush that fits the top clearer. The gouts still prevail, however, and "we have increased the number of times we pick the clearers, but it seems the more we pick them the more gouts we get. That seems strange, but I find some consolation in the fact that I read in the last issue of COTTON that some of those fellows in the Southeast are having this same trouble."

"My experience has been the same," said Mr. Poole. "The more we pick the clearers the more gouts we have. I have tried setting up on the spooler guides, but they get by some way, somehow. We are now going over the spooler guides once a week and checking up on the settings to see if they are set as they should be set. Sometimes the spooler hands will raise the guide up and chuck a little waste in there, and I think that is where some of our spooler gouts come from. We find also that some of our gouts come from blowing down and cleaning over the warpers."

A gentleman from the Houston Textile Mills said he had found that bad piecing-up in the spinning was a prolific cause of spooler gouts. "Another thing," he said, "is bad rolls in the middle on the spinning frame, which will not give the proper bite between the middle and front rolls. I am now putting in new rolls in the middle the same as in the front."

Mr. Tatum was asked if he uses under-clearers on the intermediates, and his overseer of carding, Joe Stinnett, replied in the affirmative, declaring that he gets better results by using them.

Mr. Whetstone said that at one time he had been bothered with gouts in the yarn, and investigation showed him that the under-clearers on the frames were pinching right up between the rolls and biting the roving off, and so he took off the under-clearers and has eliminated the gout trouble. Mr. Tatum said he was going to try this also.

Mr. Tatum had another question: "What causes fuzzy yarn?" Mr. Wilson said he had this trouble until he began changing travelers regularly. Now, he reported, he changes travelers every ten days regardless of the apparent condition of the traveler. Mr. Poole and W. F. Smith, superintendent, Houston Yarn & Twine Mills, Houston, agreed that irregularity in the staple was one cause. Mr. Coman suggested humidity as a cause, but Mr. Clarke disagreed, adding that in his opinion it was excessive clearer board waste and an excess of short fibers in the cotton.

Mr. Tatum said he and Sam Morton were going through Mr. Clarke's mill that morning, and that Mr. Morton had showed him a way to stop it: by rolling the roving back of the rolls, or holding a finger under it just above the thread guide.

There was no further discussion. The men enjoyed a splendid luncheon, following which the officers named at the beginning of the story were elected, and Waxahachie selected as the place of the next meeting. Following this business session the convention adjourned.

Designing for Multi-Color Damasks

by Osbert Hughes

FIG. 1

Multi-color damasks are meeting with increasing favor for use as upholstery piece goods, draperies, cushion tops, table scarfs and runners, chair coverings, and even as fancy table covers and bedspreads. They are generally woven on a solid color cotton or mercerized cotton warps, with the filling consisting of rayon alone or rayon and cotton depending on the quality of the goods. The warp is made from 30/2, 40/2, 50/2 or occasionally 60/2 yarn, and 150 denier or 300 denier rayon used as filling. The average construction is usually about 96 x 48 for single shuttle damasks and 96 x 78 for two shuttle goods, although damasks have been made with a much looser construction, while the finer grades may run as high as 160 ends per inch. Multi-color damasks are woven on box looms and derive their name from the number of colors used in the filling .

Upholstery goods are woven 50 to 54 inches wide, and draperies from 36-inches up. Table scarfs and runners are usually 12½-inches wide, woven four in a loom, and 18-inches wide, woven three in a loom. They are so designed as to be capable of weaving any of the following lengths, for example, 48, 54, 60 and 72 inches, by adding or removing the necessary section of pattern cards. Chair coverings are woven with patterns of small repeats, usually 2, 3, or 4 inches square. Cushion tops are made 25 inches square, woven two in a loom, on a 12½-inch center tie. Table covers and bedspreads will require a cross border tie, and may be woven any required size, according to the capacity of the jacquard and the loom.

Either French index or fine index jacquards may be used for these fabrics. A French index of 624 hooks capacity, with a straight tie, will weave a fabric of 96 sley with a repeat 6¼ inches wide. This repeat may be doubled by using a center tie, and this tie-up is extensively used for piece goods and 12½-inch scarfs. A double French index or a single fine index will give a repeat of 12½ inches in width. For the 18 inch scarfs a fine index jacquard with a 9-inch center tie is required.

Repeater motions will be found very useful on box looms, to eliminate changing shuttles by hand or using excessively long unwieldly box chains.

The ground weaves used are the 5-, 8-, and 10-harness satins, depending on the construction of the cloth. A repp ground is used for the reversible or duplex fabrics.

Occasionally the design is copied or adapted from imported fabrics or historic designs. More frequently, however, the design is worked up from an original sketch. The type of fabric intended must be kept in mind while making the sketch, as a design containing a great amount of detail will be best fitted for a fabric with a fine construction, while a low construction cloth is better developed with a bold vigorous design with not much fine detail in it. Also designs intended for change shuttle fabrics must be so colored that the planted figures will not overlap.

The various bindings used, twills, satins, diamond weaves, shaped bindings and fancy effects should be so managed as to bring up the figures to their best advantage. The feature portions of the design should be floated to the limit, to give them the desired prominence, while smaller figures, background details, etc., are shaded down with tighter weaves. The point paper required is calculated from the construction of the cloth. A one shuttle damask, with 96 ends and 48 picks per inch, would require 6 x 12 paper, while a two-shuttle damask, of 96 x 64 construction, woven pick-and-pick and with two cards cut from each line, would take 8 x 24 paper. Point paper may be obtained with the ground satin weave printed on it, or plain paper may be used and the satin painted or stenciled in by hand.

When designing a one-shuttle satin damask, the figure is washed in with some transparent color, say red, and the ground satin painted in with the same color. The bindings on the figure are then indicated with black or white paint. The satin weave on the figures should run in the opposite direction to that of the ground. To weave this fabric face up the card cutting directions are: cut black (or white) and paper. A sample of this type of fabric, using the 5 harness satin weave on both ground and figure, is shown at Fig. 1.

The reversible or duplex fabric is extensively used as a drapery, also for upholstery goods and sometimes as a bedspread. The ground weave of this fabric is plain weave, or tabby, and both warp and filling floats are utilized to develop the figure. Where the filling is floated on one side the warp is floated on the reverse, and vice versa. Therefore, when painting out the design, both sides of the cloth have to be taken into consideration, and care taken to keep the two effects balanced. Otherwise the cloth will have a one-sided appearance. The point paper design for a one-shuttle duplex is painted as follows: The warp float is painted in red, and the plain weave ground with red also. The filling float is painted in yellow. The bindings on the red are painted in black or white on the ground tabby, and those on the yellow in red on the opposite tabby. The card cutting directions are; cut red.

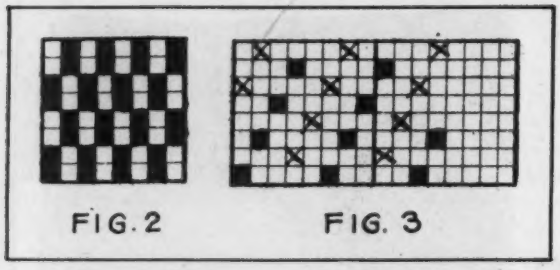


FIG. 2 FIG. 3

This duplex fabric may be greatly elaborated by using two colors of filling run pick-and-pick. The ground used is a repp weave, and where one filling appears on the face, the other floats upon the back. A third effect may be obtained if desired by using the warp float, which effect appears on the reverse side as a mixture of the two shuttles. This third effect should be very sparingly used, chiefly as a shadow effect. This fabric may be still further enriched by running one change shuttle and one steady shuttle, in which event care must be taken when designing to prevent the planted figures from overlapping each other at the change point. The design should be painted as follows: The point paper is laid out to cut two cards from each line, one for each shuttle. One filling effect is painting in red, the other in yellow, and the warp effect is blue. The ground effect is tabby painted in blue, which gives a repp weave in the cloth, each warp thread being over two picks and under two picks, as shown in Fig. 2. The red is bound with yellow, and the yellow with red, both on the tabby cord. Twills, satins, and fancy effects may be used as bindings. The card cutting directions are as follows:

First card. Red shuttle; cut yellow and blue.

Second card. Yellow shuttle; cut red and blue.

If the warp effect is used, the blue is bound with white on the same tabby as the ground, and the white omitted when card cutting.

Two shuttle satin damasks are extensively made with both running shuttles or one running and one change or planted shuttle. The cards are often cut to weave one satin on the face, and to bind the back with a looser satin to prevent the feel of the cloth from being hard. However, when the fabric is used as a chair covering or upholstery cloth, a hard feel is sometimes desired. The point paper is calculated to cut two cards from each line, one for each shuttle. The design should be painted as follows: One filling effect is painted in red, the other in yellow. The mixture effect, when both shuttles are floated on the face together, is painted blue. The red and yellow are bound with black on the tabby cord, as is also the blue. However, shaped bindings and elaborate fancy weaves may be used on the red and yellow, as on the design paper only the filling floats need to be taken care of. The blue (mixture effect) requires twills, satins, or diamond weaves, to prevent the warps from forming long strings on the back. The ground satin is painted in two separate colors, say pink and green. The card cutting directions, to weave face up, are as follows:

First card. Red shuttle; cut yellow tabby, black, pink and paper.

Second card. Yellow shuttle; cut red tabby, black, green and paper.

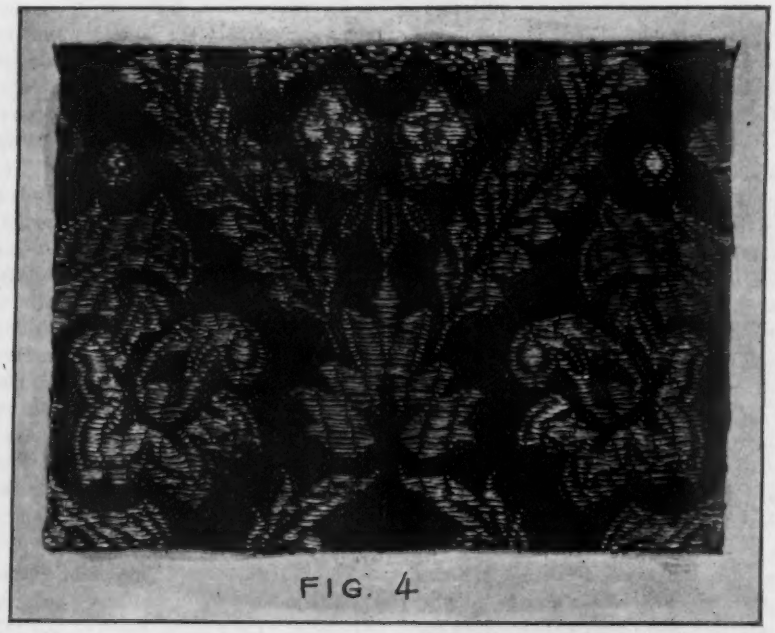


FIG. 4

Figure 3 shows the way this ground satin is painted. The pink is represented by crosses and the green by full squares. The 8-harness, 10-harness, or other satin weaves may be indicated in the same manner, as may be desired.

Two shuttle duplex and satin damasks may be greatly reduced in cost by using the second shuttle as spot figures or as scattered places in the design, and substituting a cotton filling in place of the more expensive rayon in those places where it is entirely on the back of the cloth. This will have all the apperance of rayon-filled goods as the substitution of rayon by the cotton filling will not be apparent on the face of the cloth. Fig. 4 shows a piece of two shuttle multi-color damask.

CURRENT TOPICS

"A Special Providence."

"Congress has not made of us a special providence," said a member of the Interstate Commerce Commission in dissenting from an important ruling made recently by the commission in a freight rates case. The commission evidently took the view that it is in some degree a "special providence," whose business it is to support the weak, correct general economic defects, and be a business and social equalizer. The ruling is quite important as a probable precedent and is of particular concern to persons affected by shifts in industry.

For several years, the business of the bituminous coal operators of Western Pennsylvania and Ohio has been declining. The business of operators further south, in West Virginia and Kentucky particularly, has been increasing. Many complex causes have to do with the change. Operators of the northern mines have been beset constantly by labor troubles, even lately they have been wrestling with a strike. They have had to make concessions that meant putting the price of their coal above economic and soundly competitive levels. They have not been free to adopt new methods of production or distribution. Operators of the southern mines have been free, energetic, enterprising. Though it cost them more to put their coal into the big markets of the Northwest, the southern operators were shipping, by the northern mines, more and more to Lake Erie ports for trans-shipment.

The northern operators said that freight rates were unfair to them and for ten years they endeavored to bring about a widened margin in their favor. The Interstate Commerce Commission turned them down in 1917 and again in 1925. Recently the commission ordered a 20 cents a ton reduction on coal going to lake ports from the northern mines. The commission also indicated that a corresponding reduction by the railroads of rates for competing coal from southern mines probably would be forestalled.

While holding that, considered by themselves alone, the rates from the northern mines were too high, the commission took into account the general conditions in the industry. And the ruling patently was for the purpose of "helping" the northern producers and curbing those in southern fields.

The commission had legal warrant for considering the "depression" in the northern fields and for contributing towards its removal, whatever its cause. For in 1925 Congress, in making a gesture of farm relief via freight rates, directed the commission to consider "conditions" in localities, sections and industries when making changes in the freight rate structure. That is, it became the commission's duty to do more than establish and maintain "just and reasonable" rates. Congress gave it specific authorization to "help" the troubled by raising or lowering rates in so far as might "lawfully" be done without regard to traditional principles of rate making.

Congress went further—much further. It directed that an investigation of the entire rate structure be instituted with the view of correcting all of its faults, everywhere. This of itself is a good move, for the structure, a creature largely of accident, is a terribly faulty one. But in the light of the broadened basis of rate making, now including virtually everything social and economic, the undertaking is one that is fraught with a good deal of danger.

"It is easy and natural to make of the rate adjustment a scapegoat when prices fall or markets are slipping away to competitors—easy because freight rates are tangible, and natural because freight rates are subject to governmental regulation where prices and costs and wages, and the myriad incidents of business operation, are not," said Commissioner Hall in dissenting to the commission's decision in the lake cargo coal case.

Politics—not necessarily of the bad kind—had much to do with the coal case. Agitations growing out of the case shaped in measurable degree the present personnel of the commission. Politics may have a lot to do with other cases that will arise on account of the wider leeway given the commission. These cases will bear on the entire economy of the nation, and aside from the question of just and reasonable rates. Localities, sections, industries, and branches of the latter, must be prepared to protect their rights against invasion by reason of Congress' effort to make of rate regulation an equalizer of fortune. For none can be "helped" with undue advantages as to carrying costs without others being hurt.

Lindbergh and Aircraft.

No one of red blood can begrudge the unprecedented honors given the young fellow who alone braved the wide Atlantic in an aeroplane and succeeded in flying from New York to Paris. It was a glorious feat.

The best effect of the unprecedented celebration of Lindbergh's achievement will be the focusing of attention on aircraft, its possibilities and its future. Men have been flying in heavier than air machines for nearly twenty-five years. The navigable dirigible has been in use for almost as long a time. Yet, for more than incidental and spectacular services, aircraft still is of comparatively negligible use in transportation. All the freight carried by it throughout the world on an average day probably would not fill a dozen railway freight cars, and the total of daily passengers could be comfortably quartered in perhaps as small a number of Pullmans. Aircraft, however, does render unique and important services which could not be procured by other means, as in the carrying of mail with a speed beyond that of any other carrier of things. It was of pertinent military service during the World War, and no doubt will figure much more in the wars of the future.

But it may be doubted if any other invention was still so nearly within its purely experimental stage twenty years after its elemental practicality was demonstrated.

Lindbergh's crossing of the Atlantic was antedated by others as long ago as 1919. The prize for which he flew had been outstanding for about five years, with, until recently, no bidders for it. A plane has been flown over

the North Pole, others have been driven around the world, others up and down and across all the continents.

Yet aircraft has not confirmed more than a fragment of the hopes that were attached to it when first demonstrated to be possible. It isn't much safer than it was ten years ago, its carrying power has been only slightly increased and its reach by way of distance only incidentally extended.

It may be, as an expert on the subject has set forth in a long published study, that the aeroplane and dirigible still are not much more than amazing toys. And it is possible that in the absence of further basic discoveries and the application of entirely new principles they never will be much more.

This isn't the popular view, which, contrary to the customary assumption, is not suspicious of all revolutionary discoveries. It is probable that the run of people believe firmly that perpetual motion is possible. Those who claim to have discovered it invariably get serious attention, from the crowd as well as thoughtful individuals. The more marvelous a prospect be the readier most of us believe in it.

Everything feasible should be done, of course, for the further development, commercially and otherwise, of aircraft. But it will be done best if a soundly correct perspective is maintained.

Seventeen Arkwright Medals Awarded.

At the Asheville meeting, seventeen members of the Southern Textile Association were distinguished by being awarded the medal of The Arkwrights, Inc., the research organization of the Association. Each of these men had completed satisfactorily, a test assigned by the Research Committee of The Arkwrights, and therefore were elected to receive the First Degree Medal. The presentation was made by Joe M. Gamewell, president, Erlanger Cotton Mills Co., Lexington, N. C.

The names of those to whom the medals were awarded, together with the subjects of their tests, follow:

F. GORDON COBB, vice-president and general manager, Lancaster (S. C.) Cotton Mills Co. "Comparative test to show the difference in breaking strength of 30s warp yarn spun with a combination warp and filling traverse and the regular warp traverse. Yarn to be made from one-inch American cotton."

JAMES A. CHAPMAN, JR., vice-president and superintendent, Inman (S. C.) Mills. "A comparison of results from warp wind, combination wind and filling wind when used in spinning warp yarn."

CARL R. HARRIS, assistant superintendent, Inman (S. C.) Mills. "End breakage and breaking strength in spinning 30s warp yarn by setting slubber, intermediate and speeder rolls as follows: Staple of cotton plus 1/32 inch; 1/16 inch; 3/32 inch; 1/8 inch, and 3/16 inch."

MARSHALL DILLING, superintendent, A. M. Smyre Mfg. Co., Gastonia, N. C. "Difference in spinning 60s combed yarn from 1⅛-inch cotton with three and four processes of roving."

STANLEY A. BLACK, Mollohon Mill, Newberry, S. C. "A test to determine the percentage variation in turns per inch in plied yarns made on tape and band driven twisters."

RICHARD W. ARRINGTON, superintendent, Union Bleachery, Greenville, S. C. "Determination of gain or loss in tensile strength of cotton piece goods due to various operations in a chlorine bleach."

GEORGE F. BRIETZ, superintendent, Selma (N. C.) Cotton Mills. "Comparison of breaking strength and ends down per 1,000 spindles per hour from yarn made from a card producing 8, 12, and 16 pounds per hour, using the same weight lap and same weight sliver and cotton."

OLIVER G. MURPHY, superintendent, Shawmut (Ala.) Mill, West Point Mfg. Co. "Percentage of different lengths of staple from one-inch cotton received from different localities."

L. O. BUNTON, superintendent, Ruby Cotton Mills, Inc., Gastonia, N. C. "Comparison of results of 11 draft and 14 draft on spinning on 40s hosiery twist yarns. 1⅛-inch cotton."

G. A. FRANKLIN, general superintendent, Sibley Mfg. Co., Enterprise Mfg. Co., Augusta factory, Augusta, Ga. "Percentage of Weight and Strength Added in Sizing."

W. H. GIBSON, JR., manager and superintendent, Aileen Mills, Inc., Biscoe, N. C. (Same as G. A. Franklin).

W. A. BLACK, superintendent, Beaumont Mfg. Co., Spartanburg, S. C. "Percentage of contraction on goods

The medal awarded by The Arkwrights, Inc., to applicants successfully completing assigned textile tests. There are three degrees in the organization, the degree being indicated by the number at the bottom of the design. The two subsequent degrees to be conferred upon the approval of further tests.

construction of 30s to 40s yarns and constructed of 9s to 18s yarns, made on looms with high take-up roll."

P. A. SMITH, general superintendent manufacturing, Manville-Jenckes Co., Gastonia, N. C. "Test 21s yarn made from various twists in roving for ends down per 100 spindles per hour and breaking strength."

H. K. HALLETT, manager, Kendall Mills, Inc., Paw Creek, N. C. "Test 30s yarn made from various twists in roving for ends down per 100 spindles per hour and breaking strength."

IRA L. GRIFFIN, southern representative, Stein, Hall & Co., Charlotte, N. C. "Comparison of percentage of added weight from sizing as shown from desizing of samples of one style of goods taken from ten different mills and samples of another style of goods taken from ten different mills."

J. O. EDWARDS, superintendent, Icemorlee Mills, Monroe, N. C. "Comparison of breaking strength and variation in number from creeling drawing frames all at one time against creeling as each can becomes empty."

HOWARD C. MCKENNA, overseer weaving, Planters & Merchants Mills, New Braunfels, Texas. "Breaking strength of yarn before and after sizing, also percentage of added weight."

Increasing recognition of the work of The Arkwrights, Inc., is noted in the reproduction of the tests of Messrs. Cobb, Chapman, Harris and Dilling, in a recent issue of the Journal of the Textile Institute, a leading research organization with headquarters in Manchester, England. A cooperative coordination between the Arkwrights and the research work of the Cotton-Textile Institute also is in prospect.

MATHIESON
Industrial Chemicals

Where Fashion Leads, Dyers Must Follow

Good old Turkey Red! Reliable Indigo Blue! Once these were popular colors! But since Fashion has dictated the use of subtle shades and tints, simple colors have been replaced by hues that can be achieved only through the most careful dyeing processes. Moreover, these new colors must be produced so economically that the textiles themselves may be sold in a competitive market.

This demand for better dyeing and finishing has emphasized the need for every possible saving. This need for economy has brought home to many textile mills the opportunity offered for cost reductions through the use of straight alkalies.

CAUSTIC SODA
LIQUID CHLORINE
BICARBONATE OF SODA
MODIFIED VIRGINIA SODA
SODA ASH
BLEACHING POWDER
ANHYDROUS AMMONIA
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Substantial savings are now being effected by substituting straight alkalies for prepared alkali mixtures. Mathieson 58% Soda Ash and 76% Caustic Soda are being purchased individually, at a substantial saving in first cost. Solutions of any desired strength are thus easily prepared, and the savings in first cost are augmented by economies that inevitably follow in the wake of uniform processing materials.

The adoption of EAGLE-THISTLE straight alkalies for your processing will help you cut costs and, at the same time, improve the quality of your product. Write to the nearest Mathieson office for further information.

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Deal Direct with the Manufacturer

Saxophone Band from the Leaksville, Spray and DraperPlants of The Carolina Cotton & Woolen Mills Company.

Music in the Mill Village.

An example of the possibilities in the development of community music activity in mill villages is afforded by the progress made by the Carolina Cotton & Woolen Mills Co., at Leaksville, Spray and Draper, N. C., along this line. In 1922 the company engaged Prof. O. A. Kircheis, as director of the music department, with Miss Edna Marie Grotefendt as assistant director, as whole time instructors. These directors, believers in music of the highest type, are accomplishing remarkable results in the training of the people in the several villages. They believe there is a musical side to every normal person, and that to be properly and symmetrically developed every individual should receive some training in music. Further, that musical training aids men and women to be better workers in their homes and at their work, and helps children in their school work. Music teaches one to bring all his or her faculties into coordinated play. The mind, eyes, ears and hands are trained to work together quickly and accurately.

Recently a week's festival of music, held first at Leaksville and then at Draper during the subsequent week, gave a demonstration of what has been achieved along musical lines in the trio of mill villages. The musical aggregations now operating under Professor Kircheis and Miss Grotefendt include an adult band of 38 pieces, an orchestra of 70 pieces, and a 24-piece saxophone band, a juvenile orchestra and children's chorus. The saxophone band is shown in the accompanying illustration.

The program mentioned was opened on a Sunday with a sacred concert and community sing. On Monday evening over 150 children took part in a concert, the opening feature being five songs by 100 children accompanied by the juvenile orchestra. On Tuesday evening the program was given by the juvenile band and orchestra and singers who participated in the previous evening's program. A three-act operetta, "Genevieve," was presented on Wednesday evening by the combined girls' singing classes of the three communities. Thursday the adult orchestra presented the program, while the saxophone and reed band and guitar ensemble offered the Friday program. The final program, on Saturday, was given by the adult band in the form of a concert. This program was held in conjunction with National Music Week.

What the Southern Mills are Doing.

Thirty new houses will be built in the village of the American Spinning Company, Greenville, S. C. Contract has been let to the Townsend Lumber Company. The total cost will approximately $70,000.

Oakland Cotton Mill Division, Kendall Mills, Inc., Newberry, S. C., is replacing 640 looms with a new model. Also, 50 new houses will be built in the village.

The details of the extension wrok at the Mills Mill No. 2, at Woodruff, S. C., include the installation of 700 Draper looms and 8,000 to 10,000 spindles from Saco-Lowell Shops. Preparatory machinery will be furnished by Whitin Machine Works. Lockwood, Greene & Co., Inc., Spartanburg, S. C., are the engineers.

Brandon Mills, Greenville, S. C., have installed modern opening and cleaning equipment, and have also equipped one-third of the plant with Barber-Colman automatic spooling and warping equipment, as well as making a number of other improvements.

Liberty Fabrics Corp., of Union, S. C., has been formed with a capital of $350,000. Emslie Nicholson is president. The company has taken over the business of the Liberty Fabrics Corp., Brooklyn and Tonowanda, N. Y., and machinery will be moved from those points to Union. Sidney M. Edelstein is industrial engineer.

New machinery including 2,240 spindles, to balance

IF YOUR MILL IS LOCATED IN THE SOUTH

Charlotte Office and Shop

You Will Find It WORTH YOUR WHILE to take advantage of our SUPPLY DEPOT AND SHOP at Charlotte, North Carolina

where we have complete facilities for reclothing your flats and licker-ins, and keep on hand, for your convenience, a large supply of repair parts for our complete line of cotton machinery.

SACO-LOWELL

Largest Manufacturers of *It pays to Install Modern Machinery* Textile Machinery in America

production facilities, has been installed by the Aragon Mills, Aragon-Baldwin Company, Rock Hill, S. C.

Mollohon Mill, Kendall Mills, Inc., Newberry, S. C., will add 20,000 spindles to increase the output.

Clinton Cotton Mills, Clinton, S. C., have installed 20 new Saco-Lowell cards and complementary equipment.

Graniteville Manufacturing Company, Graniteville, S. C., is building two homes for overseers.

Appleton Manufacturing Company, Anderson, S. C., is remodeling the basement of the main plant for warehousing purposes.

A new opening and ageing building, and a community house for the village, have been added to the extension work at the Dixie Mercerizing Co., Chattanooga, Tenn., which already included a new 363x107 foot, one and two story extension to the spinning mill and 60 new cottages in the village.

Aponaug Mfg. Co., Kosciusko, Miss., is replacing plain looms with 51 new Draper models and is also installing additional drawing frames.

American Bemberg Corporation, Johnson City, Tenn., is to add another $3,000,000 unit to their present facilities for the manufacture of rayon. The present unit will be enlarged twenty per cent.

Morrillton Cotton Mills, Morrillton, Ark., have been incorporated for $300,000. The company is removing machinery from Groveville, N. J., to Morrillton for the manufacture of duck, etc. Ellis T. Gurry is manager.

Opp Cotton Mills, Opp, Ala., will double the capacity of the plant. Forty additional houses will be built in the village.

Little Rock Textile Company, Little Rock, Ark., is building a mill of 1,500 spindles for the manufacture of wrapping twine, cord, rope and other products. C. P. Hoke is president, and J. G. Sanders, formerly superintendent of textiles at the Arkansas Polytechnic College is superintendent. The plant will be in operation in the late summer.

Rhodes-Rhyne Mill, Lincolnton, N. C., will erect an annex, which, when completed, will contain the dyeing and slashing departments.

Chadbourn Cotton Mills, Chadbourn, N. C., have been incorporated for $100,000. D. R. Connor, F. T. Bruning, G. W. Dove and others are among those interested.

The new Theis Dyeing and Process Company, Belmont, N. C., will be one story, 247x143 feet, with basement. J. E. Sirrine & Company are the engineers.

Holt-Granite-Puritan Mills, Haw River, and Puritan Mills, Fayetteville, N. C., have been acquired by the Cone interests of Greensboro, and considerable improvement work is planned.

An addition providing 32,000 square feet of floor space will be built at the Brown Manufacturing Co., Concord, N. C., which will provide room for 480 looms on flannels. The plant now has 16,000 spindles and 486 looms.

Contract for 46 additional cottages for the Elberton Silk Mills, Elberton, Ga., has been let.

Covington Mills, Covington, Ga., Mary-Leila Cotton Mills, Greensboro, Ga., and others, it is reported, are electrifying their plants and will use purchased power secured from the Georgia Power Company.

The new mill of the L. H. Gilmer Co., at Shreveport, La., has been placed in operation, according to announcement.

Lincoln Mills of Alabama, Huntsville, Ala., are making progress on the construction of their new unit, which will be three stories in height. Several hundred houses will be added to the village to provide for the increase in equipment.

Worth Mills, Inc., Fort Worth, Texas, have announced payment of current and back dividends to preferred stockholders and plan for the early enlargement of the plant. The mill now contains 16,000 spindles manufacturing tire fabric and tire yarns. The plans for enlargement contemplate a doubling in the capacity of the mill and starting of construction by the end of the year.

Work on the North Carolina Silk Mills, Inc., Burlington, N. C., is nearing completion. The plant will have an initial equipment of 100 looms, operating on silk, rayon and mercerized fabrics. J. Spencer Love is president; W. R. O'Hara is vice-president, W. J. Carter secretary, and A. Glenn Holt, treasurer. Dickson & Valentine Department of Frederick Vietor & Achelis will sell the product, it is reported.

A 12-room, two story school building will be erected by the Brandon Mills, Greenville, S. C., at a cost of $40,000. William R. Ward, Jr., Greenville, is the architect.

Ensign Cotton Mills, Hampton, Ga., have installed ten Universal winders and two ball warpers.

Pioneer Cotton Mills, Guthrie, Okla., have been sold at receiver's sale to Harding, Tilton & Co. The mill has been closed for six months. The new owners plan to operate it at capacity.

Southern Dyeing Co., Burlington, N. C., have removed to its new building, where an increased production is possible.

Walton Cotton Mill Co., Monroe, Ga., are installing 24 additional looms.

North Carolina Finishing Co., Yadkin, N. C., is erecting a one-story addition, to be used as a finishing room. The present finishing room will be converted into a packing department.

New England Mill Situation.

Orders in hand bid fair at this time to keep New England mills fairly busy for the balance of the summer. The mills not taken care of with profitable business are those equipped for the manufacture of ginghams. Many of the ginghams mills are closed or partly so. The Everett Mill stockholders have decided to liquidate that corporation but the form of the liquidation has not yet been agreed upon. It will probably entail the sale of the machinery and the buildings. Provision has been made for the present, to carry on the manufacture of Everett Classics and other well known Everett branded products in the mills of the York Mfg. Co., in Maine, where costs are lower.

The Amoskeag Company is not operating half its looms on ginghams, although about 65 per cent of the plant is in operation. The business taken by this company on flannels has been large enough to keep the looms engaged on those lines very well occupied for the next five months and before that time there is likely to be seen a further demand for the output to meet the needs of the late fall trade. The ticking looms are fully engaged, and many looms are running on specialties. The worsted division of the company continues to run in full and at a profit.

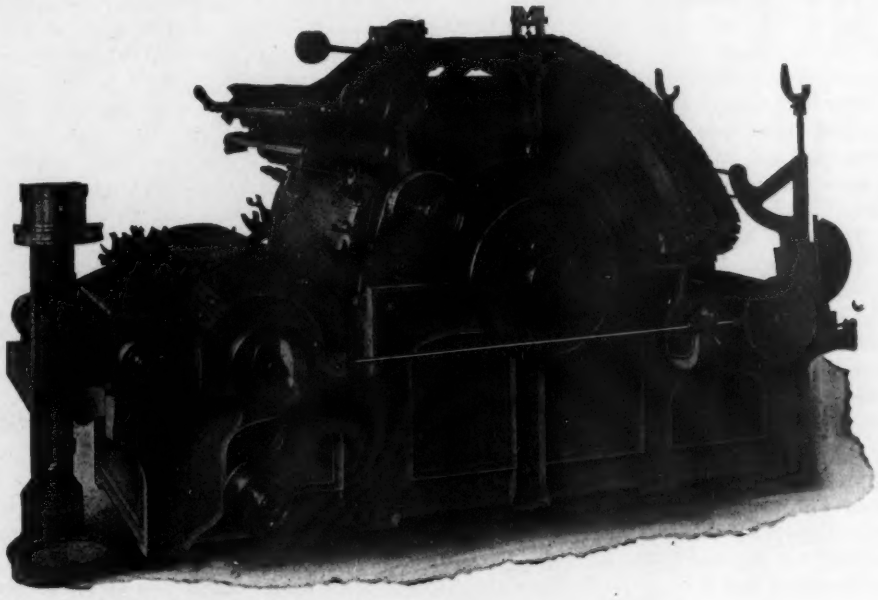
The machinery of the Hamilton mills at Lowell, Mass.,

H & B AMERICAN MACHINE CO.

Pawtucket, R. I.

Southern Office: 815 Atlanta Trust Co. Bldg., Atlanta, Ga.

COTTON MILL MACHINERY



Revolving Flat Card

OUR Cards are extensively used, and have won for themselves a high reputation for the quality and quantity of work they will do, the small percentage of waste made and their durability and simplicity.

Amongst the many features and points of special merit embodied in the machines which it would pay you to investigate are:

The Rigid Bend, mathematically correct at all stages of wear of the wire.

Perfect concentricity of Flats to Cylinder.

Arrangement for adjusting Flats whereby accuracy to the thousandth part of an inch is obtained.

Adjustable Cylinder Pedestals and Bearings.

Better quality of yarn made from the same cotton, or equally good yarn made from cheaper cotton.

Special bulletin sent on request.

has been sold and most of the plant will be dismantled. That company is in liquidation. The Parkhill division of the Amoskeag Company is fairly well occupied on fancies and novelties in yarn dyed products and shirtings. Other gingham mills in New England are either running light or not running at all. The trade call for ginghams has been largest in the goods that can be retailed under ten cents a yard. Very few of that class of goods are made in New England.

Some of the plants equipped to make fine combed yarn tissues in staple gingham checks have been operating their looms quite well. The checks have sold much better than the fancies. Most of the fancies sold have been of the embroidered dot character in sheer weaves.

The sheet and pillow case plants of New England have been doing a very steady and a profitable business although the wide sheeting market as a whole has been very bad. Pequot and Pepperell goods have been sold to capacity and on some lines departments have been running overtime. The Pacific lines have been doing fairly well, under a new sales plan put into effect early in the year and calling for agency representation by wholesalers.

The 4-4 bleached goods business has been poor in unbranded lines. The better known branded goods such as Hope, Fruits, Langdon, etc., have been sold steadily but many of the bleacheries are not being operated in excess of 60 per cent capacity. Southern plants are also affected by the slow trade in these lines. Prices have been most highly competitive on all bleached domestics due to the volume of production in excess of current consumption.

Printed goods have sold very freely up to the present time and all the larger plants continue well occupied. The job finishing printing plants have not been getting orders so freely in the past month but they are still running better, proportionally, than other divisions of the finishing industry. The corporation printers have been turning out large quantities of percales and fine specialty printed goods and such plants as the American, Algonquin, Pacific, and Windsor, have work enough in hand to keep them well occupied into August.

The printers advanced prices on narrow prints and withdrew prices on some of the narrow specialties. They continued to accept business on percales at old prices that have continued since last October. Wholesalers and dress manufacturers have been using more of these goods than ever before and the indications now are that this large consumption will be continued all through the summer months.

The purpose in continuing old prices was to maintain the steady flow of the goods as long as gray cloths did not advance too rapidly. The gray cloths have moved higher by about ½ cent a yard, from the lowest basis of the year, only.

Beside the large business in percales, there has been a good business done in printed dimities and printed rayons. Latterly there has been a very active call for white ground printed fabrics, and with the passing of the solid ground cloths and the costly discharge prints, the manufacturers have been able to work out a small profit. Voiles and sateens have not sold as well as last year, but the very soft charmeuse goods, and the combed yarn foundation specialties have been moving quite well in the wash fabrics departments.

The large business on crepes of a staple character has been continued into fall and lines made by the Windsor and Passaic have moved very steadily. These cloths were originally used most largely for kimonos but they are now printed in dress patterns and are used freely for children's dresses and for other purposes. Printed draperies have sold in moderate volume. They do not appear to have done as well as last year although the movement continues much above the average.

Finishers have found plenty to do on some lines of rayons for dress and underwear purposes. The large corporation printers have been very cautious about going into rayon work as there is such a wide variation in the character of foundation cloths that they cannot rely upon results that are satisfactory in finishing. Considerable research work is being given in all the large plants to the development of foundation rayon mixtures that will not slip or spoil in the ordinary finishing treatment.

Next season there is little reason to doubt that the large printers will have developed many sheer foundation fabrics on which they can print designs that will not submerge the beauty of the rayon yarns. Whatever manufacturers may think of the merit of many of the rayon goods they handle, there is no doubt whatever that the public is willing to pay, and does not expect the same degree of satisfactory service from a rayon mixture that used to be exacted of cotton, or cotton and silk mixtures.

The best results in rayons to date are those reached on yarn dyed woven of plain striped fabrics printed in small designs widely scattered over the textures.

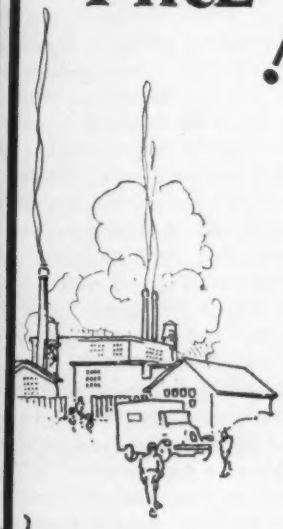
Most of the ticking business now taken in New England is of a fancy character. The large high grade mattress manufacturers are using more of the finer and more closely woven colored fancies in tickings and New England mills have been able to hold on to a great deal of this class of work, while the staple business, save in the case of Amoskeag ACA has gone south. Most of the very fancy colored weaves in tickings made in this section are guaranteed fast, thus adding to the expense of the cloths.

The New England bedspread business has been undergoing competition of an unusual character. The craze for rayon spreads has become so general that many mills quite unable to produce fine white jacquard work have gone into light weight colored rayon spreads of sheeting weights that sell as low as 75 cents to $1 at retail, so that the New England goods starting at $1.50 are somewhat restricted in their markets. It was at first attempted to get away from this competition by going into the production of very fine high grade rayon jacquard weaves with the floral and other pattern effects raised on a colored foundation.

For a time this line of goods sold freely, but the markets became flooded with colored spreads in stripes, scalloped work, and in a few lines of light weight cheaply made jacquard patterns, so that for a time buyers found it easier to meet popular demand with a low price than to bother with the better grades. There has been a revulsion against many of the low grades and the mills in this section have developed very finely woven light weight damask rayon decorated fabrics that are wonderfully artistic and will give excellent service.

These newer goods are now beginning to sell to the discriminating trade and gradually the business is increasing. Bed sets, comprising the spreads and pillow covers, and in some instances, draperies to match, are being produced and some of them are selling very well. There is no de-

UNDER FIRE!



DAY in and day out your jacquard machines are "under fire." Crashing blows, wear and tear, time—all take their toll.

To know that your jacquards will stand up, to know that they can be depended upon under the most gruelling conditions, to know that they will operate perfectly "under fire" — that's the satisfaction of owning Halton Jacquard Machines.

We do harness building of every description.

We are prepared to furnish at short notice comber-boards, lingoes, mails, etc., Ingrain and Brussel parts.

We do replacing and repairing of Jacquard machines of other makes as well as our own.

Immediate and expert attention our guarantee.

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nying that the market on the low end goods is badly overstocked and profits have dwindled.

Another bad case of overdoing has been seen in the rayon drapery business. So many cheap imitations of the better grades of eastern goods came on to the markets in the past year that today's situation is one of severe liquidation of the inferior goods and not much activity in the better grades. Looms are being diverted from the work. Curiously enough, there has come forward recently a renewed call for the better grades of marquisettes for curtain purposes, and for the very high grade gernadine curtain materials.

In a financial sense, there is further improvement noted in New England cotton mills. Mill shares are selling at slightly higher prices and recent dividend payments have been slightly larger and promise to be more regular. At Fall River, a plan is afoot to see if a million spindles may not be brought together in a consolidated interest so that several mills now barely holding their own may be reorganized as to equipment and also as to methods of merchandising the products. It is not yet clear that this latest attempt to do the obvious thing in providing the Fall River print cloth mill status with a financial backing and a stronger mercantile direction will amount to anything more than talk. It is one of the curious sidelights of conditions in Fall River, that some mills there are doing just as well as cotton mills elsewhere, notably the King Philip, Charlton, Osborn, Pilgrim, Sagamore, and so on, yet only 75 per cent of the total equipment of the city has been occupied this year.

In New Bedford, the situation and outlook are distinctly better, largely because of the stronger financial backing afforded to the plants and to the vast change that has taken place in the character of the output. Fine rayon materials in New Bedford have blazed a market trail, while many cotton and silk goods made in the cotton mills make for better conditions for the plants than anyone expected a year or two ago.

While the cotton movement into New England has been of fair volume it is very apparent from the character of goods being sent out that the change in market demand is making cotton of less importance than it used to be in this section.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, June 11th, 1927.

Floods in the central valleys and drouth in parts of West Texas,the East-Gulf and South-Atlantic states, and a second rise in the rivers of the central belt, having followed in the wake of April excessive rains in the Mississippi Valley, influenced a further rise of about $7.50 per bale in the value of raw cotton during the past month, making a sensational advance of about $25 per bale from last winter's low price levels.

Of late partial relief was obtained from needed scattered rains, light to heavy in localities, in the western half of Texas. The drouth has been pretty well broken in the East-Gulf and South-Atlantic sections, and beneficial rains have fallen in nearly all other sections of the cotton region.

The June rise in the central valleys occasioned some alarm as to the possibility of much cotton land being inundated for the second time this year, and while such an occurrence is possible to some extent in parts of the river counties previously under water in Missouri, Arkansas and northwest Mississippi, the late rise in the upper river districts is not likely to affect the lower Mississippi valley where the water continues to fall, except, perhaps, to make slower the receding of the flood.

At present indications are for a moderate yield of about 16,000,000 bales including linters, and as the world's carry-over of American cotton at the close of July next will probably be about 7,500,000 bales vs. 5,362,000 at the close of last season, which would be the largest by about 2,000,000 bales since 1921, there are, at the moment, prospects for a total supply for next season of about 23,500,000 bales of American cotton against about 24,839,000 this season.

It would seem, therefore, that unless the drouth in West Texas continues, the almost steady advance in the price of cotton during the past six months has about fully discounted the prospective supply of American cotton and cotton textile trade conditions throughout the world, especially with indications for a comparatively early movement of new crop cotton, perhaps within the next sixty days.

At the moment the market is apparently technically weak because of the existence of an extensive large speculative long interest on both sides of the Atlantic, and should the weather in the dry areas of Texas change for the better by promising showers in the immediate future an important decline would not be at all unlikely. There is the possibility of such a change in climatic conditions in the Southwest now. However, if the needed rains fail to materialize in western Texas, the market may be sustained, perhaps work higher, at least temporarily.

WORLD'S AVAILABLE SUPPLY OF AMERICAN COTTON, EXCLUSIVE OF MILL STOCKS, JUNE 10.

Bales—	This year	Last year
Unmarketed, about	2,143,000	1,847,000
World's visible supply	4,511,000	2,963,000
World's available, about.....	6,654,000	4,810,000

Exports from the United States and takings by spinners of the world continue comparatively large, but the supply in America remains of moderate proportions for this season of the year, and is large abroad where stocks are heavy. Exports from the United States this season point to in excess of 11,250,000 bales vs. 8,252,000 last season, and spinners takings of American cotton this season will likely approximate 17,500,000 bales against 15,090,000 last season.

By reason of a large emergence of boll weevil at the majority of reporting stations, weevil promise to be more numerous, perhaps more active this year than for several years past, but this is a remote possibility. So far they are reported in scattered localities of nearly all sections of the belt, especially in Texas and the eastern belt, but damage so far is reported light.

American Yarn Moves Offices.

Announcement is made that the American Yarn & Processing Company has removed to its new general offices on the ground floor of the building formerly occupied by the Central Bank & Trust Company, at Mount Holly, N. C. C. E. Hutchison is president, and Arthur M. Dixon vice-president of the company.

TEXACO—for Dependable and Economical Lubrication—TEXACO

Showing HOW

TEXACO LUBRICATION ENGINEERS

help reduce Power Costs

TEXACO Lubrication Engineers know their job.

With utmost confidence and promptness—regardless of the type of machine or conditions — they have been able to suggest ways and means of cutting lubrication costs, improving machinery operation, increasing production and enhancing profits.

In one Textile Mill the start was made on the spinning frame spindles.

There, our engineers volunteered to reduce the temperatures by replacing the oil used, with TEXACO Spindle Oil.

This was agreed to, and all of the frames were lubricated with Texaco Spindle Oil—with the exception of 12 frames which were left with the ——— Company's oil, a product of high quality.

After the change, it was found that the spindles lubricated with TEXACO Spindle Oil were decidedly cooler than those lubricated with the old oil.

And we went even further:

We put TEXACO Spindle Oil on *one side* of the 12 frames using the old oil, and *in ten minutes* the temperature of these spindle bases also dropped.

In the end, friction was considerably reduced, and a material saving in power effected.

This shows only one of the many possible ways in which you may benefit by calling (without obligation or cost) upon the services of our Textile Lubrication Engineers.

There is a TEXACO LUBRICANT for every purpose in the TEXTILE INDUSTRY

And, you will find, as many mills attest, that TEXACO TEXTILE LUBRICANTS are of the highest quality, and the most economical to use.

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Texaco Petroleum Products

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OFFICES IN PRINCIPAL CITIES

NOTES ABOUT MEN YOU KNOW OR KNOW ABOUT

CAPTAIN PERRY A. SMITH has become general superintendent of manufacturing at the Loray Division of the Manville-Jenckes Company, Gastonia, N. C. He recently has been superintendent of the Ninety-Six Cotton Mills, Ninety-Six, S. C., going there from the superintendency of the cotton department of the Lyman Division, Pacific Mills, Lyman, S. C. Prior to that connection he was overseer of spinning at the Olympia plant, Pacific Mills, Columbia, S. C. Gordon A. Johnstone is resident agent at the Loray mill in Gastonia where Mr. Smith has just made a connection.

J. P. MCGRAW has resigned as overseer of weaving at the Avondale Mills, Birmingham, Ala., to become superintendent of the Lowe Manufacturing Company, Huntsville, Ala.

J. W. LANE, treasurer of J. H. Lane & Co., 250 West 57th St., New York City, died on Sunday, May 22nd.

FRANZ E. PLUMMER, of Selma, Ala., valedictorian of the graduating class of 1927 at the Textile School, N. C. State College, and winner of the student's medal awarded by the National Association of Cotton Manufacturers to the student showing the greatest proficiency in his work, has accepted a position with the cost department of the Consolidated Textile Corporation, Lynchburg, Va.

I. L. LANGLEY has been made head of the cost department of the Consolidated Textile Corporation, Lynchburg, Va., succeeding George W. Duncan, who has become connected with the Cotton-Textile Institute.

JESSE QUARLES, for several years overseer of carding and spinning at the Dothan Yarn and Cordage Co., Dothan, Ala., has been made overseer of carding at the Mobile Cotton Mills, Mobile, Ala.

JOHN P. HALLMAN has become superintendent of the Chesnee Mills, Chesnee, S. C. He formerly was superintendent of the weaving department of the Whitmire plant of Aragon-Baldwin Mills, Whitmire, S. C.

T. I. OATES, formerly overseer of carding at the Rhodhiss Mills, Rhodhiss, N. C., is now overseer of carding and spinning at the Clyde Mills, Newton, N. C.

C. B. GUNN, formerly superintendent of Aileen Mills, Inc., Biscoe, N. C., has become superintendent of the Excell Manufacturing Co., Lincolnton, N. C.

F. B. WATSON, formerly secretary and superintendent of the Cochran Cotton Mills, Cochran, Ga., has been made superintendent of the Martha Mills, Thomaston, Ga., succeeding C. H. Eldridge, who returns as superintendent of the Aldora Mills, Barnesville, Ga.

STANLEY A. BLACK, formerly night superintendent Mill No. 3, Lancaster Cotton Mills Co., Lancaster, S. C., has accepted a position with the Mollohon Mill, Kendall Mills, Inc., Newberry, S. C.

WILLIAM R. O'HARA, for years connected with The Stafford Company, with headquarters in Charlotte, has resigned to become associated with Spencer Love, Burlington, N. C., in the management of several mill properties. Mr. O'Hara is vice-president of the North Carolina Silk Mills, Inc., which have just been incorporated at Burlington, N. C.

T. H. FLOYD has been made superintendent of the Tallassee Mills, Tallassee, Ala., succeeding B. G. Stumberg, who went to Anchor Duck Mills, Rome, Ga., as superintendent. Lee Sens has been appointed assistant superintendent at Tallassee Mills.

JAMES WALKER, formerly superintendent of the Welaunee Waste Mill, Bibb Mfg. Co., Porterdale, Ga., has accepted a position with the Barrow County Cotton Mills, Lawrenceville and Winder, Ga.

J. T. HULL has become superintendent of carding in Mill No. 1, Rhodhiss Mills, Rhodhiss, N. C., succeeding T. L. Oates, resigned.

J. H. WEBB, treasurer of the Eno Cotton Mills, Hillsboro, N. C., died on May 25th in a Durham hospital, following a long period of illness. He is succeeded in the active management of the plant by Cheshire Webb, president.

J. P. MOSES, recently connected with the spinning department of the Brazos Valley Cotton Mills, West, Texas, has resigned to accept a position as night overseer of spinning, spooling, twisting and winding at the San Antonio Cotton Mills plant at Kingsville, Texas.

E. L. SORD is now overseer of spinning at the Brazos Valley Cotton Mills, West, Texas.

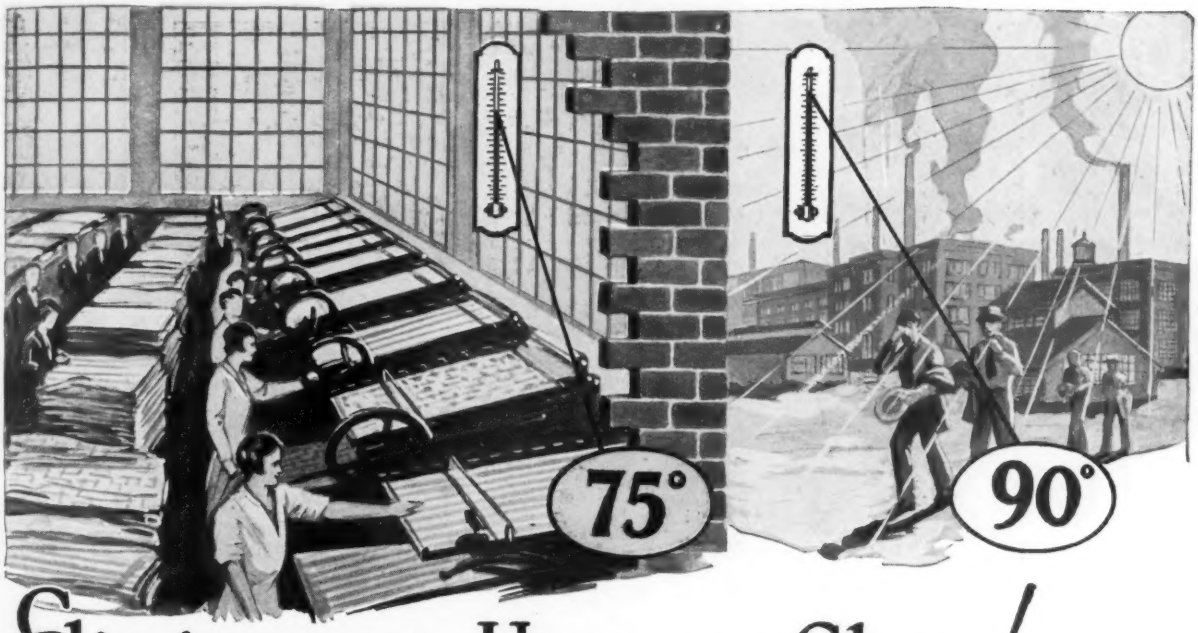
GEORGE A. MANESS has resigned as overseer of weaving at the Waxahachie Cotton Mills, Waxahachie, Texas, to become overseer of weaving at the San Antonio Cotton Mills, Kingsville, Texas.

H. R. HOLLAND is now overseer of spinning at the Henrietta Mills, Caroleen, N. C. He formerly held a similar position at the Valley Falls plant of Martel Mills, Inc., Spartanburg, S. C.

J. F. ALEXANDER has resigned as general overseer of carding, Mansfield Mills, Lumberton, N. C., to become overseer of carding and spinning at the Eastside Mill, Shelby, N. C.

G. J. BENNETT, formerly superintendent of Marlboro Cotton Mill No. 4, McColl, S. C., is now superintendent of the Rhyne-Houser Mfg. Co., Cherryville, N. C.

J. V. RANDALL, formerly second hand in carding at the Carlton Yarn Mill, Cherryville, N. C., is now overseer of carding at the Nuway Spinning Co., Inc., Cherryville. T. A. Flowers is overseer of spinning. He formerly was second hand in spinning at the Carlton Mill. L. C. Ford is night overseer of carding at the Nuway Spinning Co., Cherryville.



Eliminate *the* Heat *and* Glare!

by Coating Your Windows with SKYCO No-Glare

ONE of the greatest contributing factors to employee inefficiency is the tiring heat and glare of the sun pouring in through unprotected glass. The glare means eye-strain and half-sick workers. The heat produces that dull, sagging fatigue that "plays hob" with a steady production schedule.

SKYCO No-Glare—a Positive Preventive

Some years ago chemical research perfected a true and economic cure for these evils—*SKYCO No-Glare.* No-Glare is a sky-blue liquid that is painted or sprayed on your windows or skylights. It filters the sunlight, absorbing the red rays that cause the heat and glare—and yet allows 94% of light to enter. You can even look at the sun through it.

Surprisingly Economical

No-Glare may be coated on windows either on inside or outside (rain won't wash it off) and one application lasts throughout the sun glare season. The cost (less than ½¢ per sq. ft.) is so small when compared to expensive shades and blinds that it is almost negligible.

Used by textile mills all over the country. Sold by mill supply houses. Price $2.50 to $3.50 per gallon, according to quantity.

THE SKYBRYTE COMPANY
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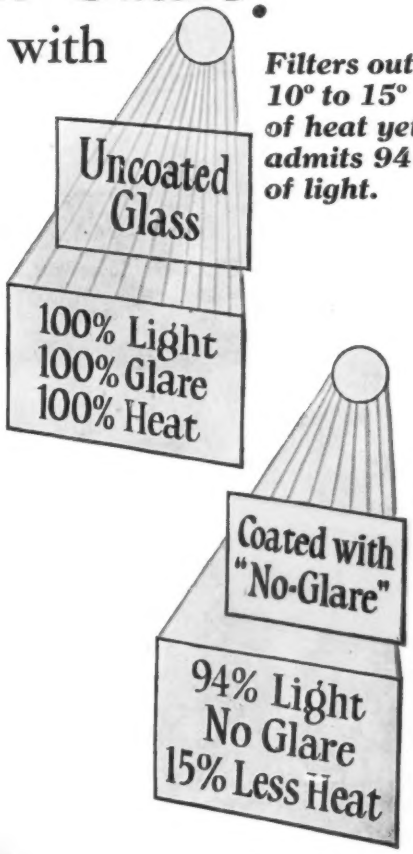
Chicago Branch: 104 So. Michigan Ave.



Filters out 10° to 15° of heat yet admits 94% of light.

Gives a Cool Diffused Light

SKYCO NoGlare

Saves Expenses of Shades

Spinning Frames in the Crown Manufacturing Company, Pawtucket, R. I., one of the best yarn mills in the country, completely equipped with U S Products.

Are You Using Uniform Bobbins?

You've seen your carder and spinner produce weak and uneven yarns on off-size bobbins and you know what it has cost you in waste and seconds. You want uniform bobbins. In fact, you must have them if you are to produce strong, even yarn and get the highest production from your mill.

Any number of manufacturers will give you general statements about the accuracy of their bobbins, but what you want is a definite guarantee of uniformity.

U S Card Room Bobbins are guaranteed to definite degrees of accuracy. Speeders 6″, 7″, and 8″ traverse, are guaranteed not to exceed .0116, and Intermediates and Slubbers, 9″, 10″, 11″, and 12″ traverse, are guaranteed not to exceed .0156 either side of the diameter specified.

Our bobbins are further guaranteed to be made of the best obtainable grades of Hard Maple, Birch, or Beech, according to your order. Birch and Maple are not mixed because they cannot be turned uniformly, and bobbins made in this way cannot meet the U S tests for Accuracy and Uniformity. We do not use Gumwood or porous, coarse-grained woods that will not give satisfaction.

U S Tailor-made Skewers

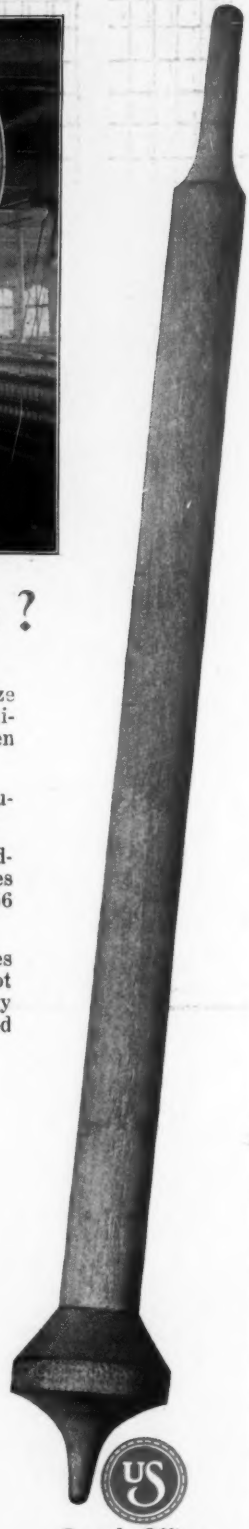
Do your skewers collect quantities of lint? Do they wobble? Do they fit your bobbins as they should—or shouldn't?

If you want a real good skewer, send U S a sample of what you are now using and a sample bobbin the skewer is to fit.

Your U S skewers will be accurately made to your individual specifications and smoothly finished.

U S salesmen are specialists on bobbins, spools, and shuttles. Order direct from U S for real helpful and understanding service.

Write, wire, or phone for prompt service.



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Atlanta, Ga.

BUILDERS OF BETTER BOBBINS, SPOOLS, AND SHUTTLES

In working with zest and giving his best,
Just for the pleasure of the giving,
In the hope of helping his brothers along,
"Old-Timer" finds the sunshine of living

It is Hard to Escape from Success.

I made the above remark the other day in the presence of several superintendents and overseers who were gathered together for a little business meeting, but the entrance of two visitors to the meeting prevented me from finishing what I had started to say.

Two or three days later I was quite amused when a very close friend told me of some remarks that were made after I had been called from the meeting.

One man asked what did the others suppose "Old Timer" meant when he made that remark.

Another said, "Well you know 'Old Timer'—he goes off half cocked sometimes."

Another remarked, "I think he was just simply bragging because he happened (get that word *happened,* will you) to have had a little better job than some of the rest of us." And another said, "Oh hell! he is getting old and does not know how we poor devils have to work to hold our jobs."

There was much more said, but I think I have told you enough for you to get the trend of the conversation.

Now what do you think of the remark, brother? Do you consider it a damphool remark, too?

If you do you have not stopped to give it real thought and consideration.

It *is* hard to escape from success, and I am quite sure I can prove it to you. The trouble is that very few of we overseers and superintendents ever try to really analyze the most important thing in our lives, and that is *ourselves.*

We are always ready to say what the other fellow's faults are and to point out how he could run his job better —how he could conduct himself so that he would have a better chance for promotion, etc., but we don't try to put *ourselves* up before the mirror and take a good look to see whether or not we are running on all six cylinders.

I could give you dozens of illustrations taken from men I have known since they started to work in the mill, which would prove beyond a doubt that "It *is* hard to escape from success," but space will not permit my going into such elaborate details.

Let me give you briefly the history of a boy whom I have known since the first day he entered the mill, and who has developed into one of the leading mill men of the South. I have been very closely associated with him, having worked in the same mill while we were both section men, and have been in touch with him through all the different jobs he has had and know intimately all of his ups and downs.

He came to the mill to learn to weave about the time Draper looms were first being started in the South. He had a graded school education. He had no money. His people were not mill people, and I do not know just why he picked the mill business except he told me he was fifteen years old and had to make a living and decided to try the mill, without having given it any special thought.

He did not make an expert weaver, but he was so attentive to his work and seemed to be so anxious to learn that the boss weaver put him on what they called a "Strikers" job.

That was what we called men we put on to learn to fix looms. His job was to oil the shafting once a week (we did not have ring oiling bearings at that time), haul up all the cloth—attend to the four toilets on that floor—do all the errands for the overseer and second hand—brush down all posts and pulleys, etc., every Friday—and during his *spare time* learn to fix looms. You can imagine about how much spare time he had. He was being paid 65 cents per day.

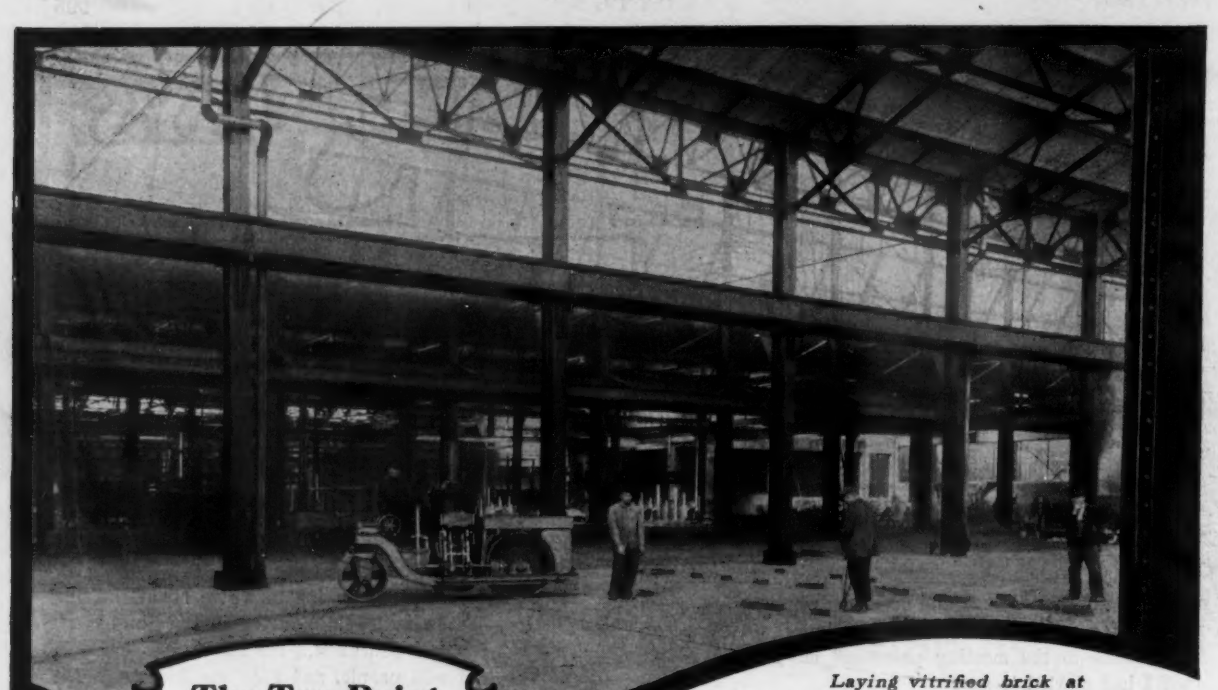
After about one year they began to let him run a section when some fixer was out—then they gave him permission to go around to the fixers every morning and ask them if they "wanted out."

Every time he got a chance to run a section a day he would try to do something on that section to please that fixer; he would ask the fixer before he went out to tell him anything he would like to have done to his looms. Well, most of the men would only be willing to go out a day when they had a lot of warps out, so he always had his hands full to keep the flags down, but if he did not have time during the day to do the things the fixer had suggested he would come back after supper and do them anyway. Then he would clean up the work bench, take all the trash from behind it and have everything looking like a new pin when the fixer came in next morning.

First thing you know the fixers began to ask the second hand to let Jim (you have heard me talk about Jim before) run their section when they asked out. Of course the overseer found that out and began to watch him.

Jim bought a blank book and started to put in that book every calculation about mill work that he could get hold of.

He asked the second-hand and overseer the reed and



Laying vitrified brick at plant of Studebaker Corporation, South Bend, Ind.

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2. *Little or no maintenance cost*
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VITRIFIED Brick PAVEMENTS

NATIONAL PAVING BRICK MANUFACTURERS ASSOCIATION, 332 SOUTH MICHIGAN BLVD., CHICAGO, ILLINOIS

harness, the numbers of yarn, the yards to the cut and all other specifications about every style of goods that was put on in the mill. He asked the second-hand to let him run up his cut boards every pay day, and he stayed in after stopping time to do the work so he would have them ready for the second-hand next morning.

He kept the cut boards so nicely that the second-hand gave him his payroll to write up also. Please keep in mind that Jim was still making 65 cents per day "spare fixing," and not getting a red cent for these other things he was doing for the second-hand. Also keep in mind that we did not have correspondence schools, night schools and catalogues with everything figured out in them like we have today.

They finally gave Jim a section and raised him to 90 cents per day. He told me he thought he was just about as near heaven as it was possible to be.

They were giving a premium of $2.00 each pay day for production, and Jim has shown me his tickets (pay envelopes) a number of times—he never missed that premium a single month he was on a section. He got most of his shuttles out of the trash boxes at the other fixers' work benches.

He got to where he could take two old worn out or bursted shuttles that had been thrown away and make a shuttle you could hardly tell from a new one. In fact he had more shuttles than it took to run his section and he would trade some of these made-over shuttles to other fixers for pieces of casting for his looms that he could not make.

Several weavers asked the overseer for a set of looms on his section. I would like to call the name of a man who is working in South Carolina today who knew of a weaver on Jim's section who was going to put in a notice to quit and he paid the weaver to exchange looms with him on change day before he put in his notice. In other words, he bought a set of looms on Jim's section.

Jim got so much information in that book that a fixer who is now superintendent of a large mill asked Jim to make him a copy of the book and he paid Jim $5.00 for it.

Jim sold those darn books as fast as he could copy them. That gave him the idea that he could make a little money on the side and he started a night school. You would be surprised, brother, if I called the names of some prominent superintendents who went to that night school.

One of the proudest possessions Jim has is a piece of property he bought with the money he made on the side and with what he could save out of his wages—that gave him a start, and now he has accumulated quite a nice bit of property. He has told me many times that he has never spent a nickle of the money he has made on the side or any of the income he has received from his property.

The boss weaver in that mill was promoted to superintendent of a new mill being built, and although Jim was just about twenty years old, he *gave Jim* the weave room.

Now honest, brother, wouldn't you have *done* the same thing?

Well, Jim ran that weave room just like he had run his section. He just simply beat everything there was in that part of the country. He got more production than any mill on the same class of goods. He had the lowest cost of any mill in the section. He had help when everybody else was short.

The International Correspondence Schools came out with a textile course. Jim bought a course on weaving; then he asked them to let him be their agent. He told the men in the mill he would help them with their course if they would buy one. He sold enough to pay for his own course and then took a course in designing, although he had never seen a dobby loom. He bought a dobby with his own money and the superintendent gave him permission to put it on a loom.

He made samples that the superintendent showed the president. The mill bought 200 dobbies and was one of the first mills in the United States to run dobbies on automatic looms.

Draper Company sent men to see them and they began to see some of Jim's work and a few years later Mr. J. D. Cloudman, who was the southern agent of Draper Company recommended Jim to the largest mill which was in the South at that time, and Jim was the youngest superintendent of the largest mill in the South.

Now honest, brother, wouldn't you have done the same thing Mr. Cloudman did?

I can't tell you much more about this man as to what has happened to him since then, because many of COTTON'S readers would recognize the man I am talking about, but just please read over the article again and explain to me how in thunder this man could have

"Escaped from Success."

"It *is* hard to escape from success" if you follow the example set by Jim.

Southern Show October 15-20, 1928.

It is announced that the Eighth Southern Textile Exposition will be held at Textile Hall, Greenville, S. C., October 15th to 20th, inclusive, 1928.

A large number of exhibitors have already made application for space, and since booths are at a premium as the show dates approach, the management is suggesting that applications be submitted at this time, though the exposition is over a year away. Information can be secured from W. G. Sirrine, president, Textile Hall Corporation, Greenville, S. C.

Anchor Post to Build New Eastern Plant.

The Anchor Post Fence Company of New York and Cleveland, manufacturers and erectors of chain link and similar types of wire fences, gates and railings, has acquired control of a site in Baltimore, and will erect a new manufacturing plant. The company now operates plants at Cleveland, and Garwood, N. J. The first unit of the Baltimore plant will be one story, 200x500 feet. The building will be equipped with an overhead traveling crane, weaving looms, a continuous galvanizing unit, etc. It will be completed in the Fall.

FREDERICK H. LEARNED, sales manager, Stowe & Woodward Co., rubber-covered roll manufacturers, was among the delegates attending the convention of Rotary International at Ostend, Belgium. Following the conclave, Mr. Learned visited several of the larger textile mills while on a tour of England and the Continent.

CHARLES BOND, president of Charles Bond Company, Philadelphia, sailed on May 21st on the Caledonia for Glasgow, to begin a six weeks trip in Scotland and England. He was accompanied by Mrs. Bond and their daughter, Miss Edith M. Bond.

"Business Control Through Analysis"

A Preparedness Text on Budget Control just issued by Ernst & Ernst

Accounting in any business can be developed, in an economical and practical way, to a point where expenditures are based on sound standards, where every dollar is intelligently spent for a cause and readily measured for its effect as a contribution toward the accomplishment of the aims of the business.

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"Business Control Through Analysis" is a 32-page booklet. It is written from the executive viewpoint, and is timely and practical. It will be mailed on request. Address nearest office.

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We expect shortly to establish a new Southern Plant in Charlotte, N. C. Our steadily growing Southern business has made increased capacity and improved service to our customers a necessity. Further details later.

Lambeth Spinning Tapes

HOW OTHER MEN MANAGE

Practical Discussions by Cotton's Readers On all varieties of Mill Subjects

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Let-off Causes Trouble in Weaving.

EDITOR COTTON:

I would like to ask the readers of COTTON, through "How Other Men Manage," how to prevent "rowey" or wavy cloth (that is, cloth with uneven places along in it) on Stafford looms using the chain let-off of the weight and lever type. I am having a lot of difficulty with this and nearly all of it is traced directly to the let-off gumming up or jumping. I am running constructions ranging from 72x76 to 60x48 prints, 30s warp.

I have tried greases of different kinds which gave satisfaction for a time but soon the same old trouble would come back. Does anyone know of a satisfactory grease or preparation of any kind? B. T. (S. C.)

How Can Stretch be Controlled?

EDITOR COTTON:

I would like to see discussed in your "How Other Men Manage" department any reason as to why two cuts of cloth, woven on the same loom, from the same set of warp yarns, will vary in the amount of stretch. Furthermore, I would like to have any readers who comment, tell how they would go about controlling this stretch. L. C. S. (ALA.)

Separating Day and Night Work on Napped Goods.

EDITOR COTTON:

Responding to "Contributor No. 672", who wants to know the best way to mark cotton goods that are to be napped so that bad work can be traced back to the weaver or loom fixer, operating a day and night shift. He states that the loom number put on the end of the cloth roll with oil crayon does not come off in the napping process and that he can trace the bad work to the loom but cannot tell whether it is from the day or night shift.

It seems to me that the most convenient and most simple method for handling this would be as follows:

Marking the day work in blue crayon and the night work in red. If one color will stand the napping process, another should, and it seems to me like this would simplify the whole proposition.

CONTRIBUTOR NO. 644.

EDITOR COTTON:

You recently published a request for a method of marking goods from day and night shifts which are to be napped, so that bad work could be traced back to the proper shift.

I will offer you the following method of marking the goods, since an oil crayon is used. When the day weaver starts his work, instead of just putting his number on the goods, let him put the word "Day" or either the capital "D" on it also. Then when the night weaver comes in, instead of putting just his number, let him add the word "Night" or a capital "N". Of course if as this man says the loom number is not removed in the napping of the goods, the letter "N" or "D" would not fade away either, and by this arrangement I think that he can tell very easily which weaver is making the bad work.

K. P. (GA.)

EDITOR COTTON:

In answer to "Contributor No. 672", will state, it is very evident that this contributor inspects his goods at the wrong time in order to detect bad work caused by the loom, weaver or loom fixer, for the process of napping is such that it is next to impossible to properly check weaving defects after the goods have been napped.

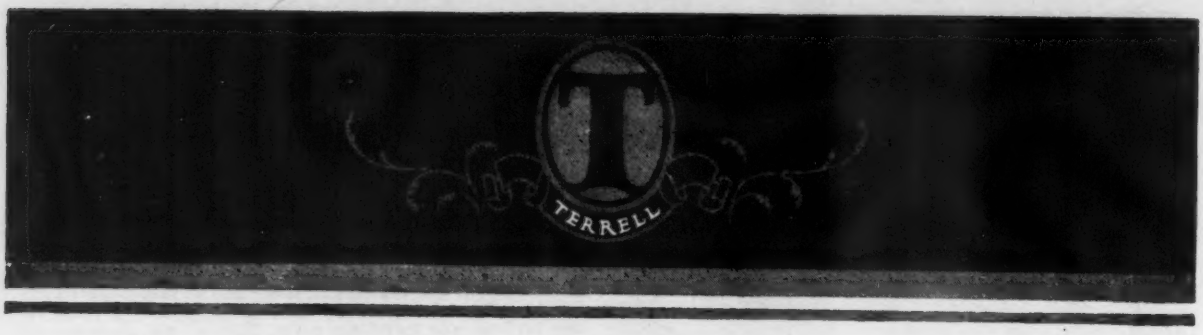
An advisable system of handling goods so as to check against the loom and weaver is to give each weaver, for each loom, stickers about ¾ x 1½-inches and have stamped on these stickers a number representing the loom and a number representing the weaver. As the cloth is taken off the loom this sticker is placed on the cloth. The cloth is then inspected, and if imperfections are noted, the weaver and the loom can readily be known by the numbers on the stickers. This of course applies to both night and day work, as the number for the weaver of each loom is different, although the loom number is the same for the day and night weaver running the same loom.

This system, of course, can apply only where the cloth is inspected after it is taken from the looms, but as stated before, that is the only time that weaving defects can be properly determined in napped goods.

If this contributor does not care to inspect his goods after weaving, he might place a weaver number, as well as the loom number, on the end of the cloth roll with oil crayon. He could then be able to discover his weaver as well as his loom.

I might add that should he use the sticker system, the stickers can be bought in any size sheets, perforated so they can be handled satisfactorily. They can be numbered by a numbering machine while in sheet form. This sticker does not injure the napping rolls nor interfere with the finish, as it is placed on the end of the cloth, but may or may not be removed during the napping process.

CONTRIBUTOR NO. 643.



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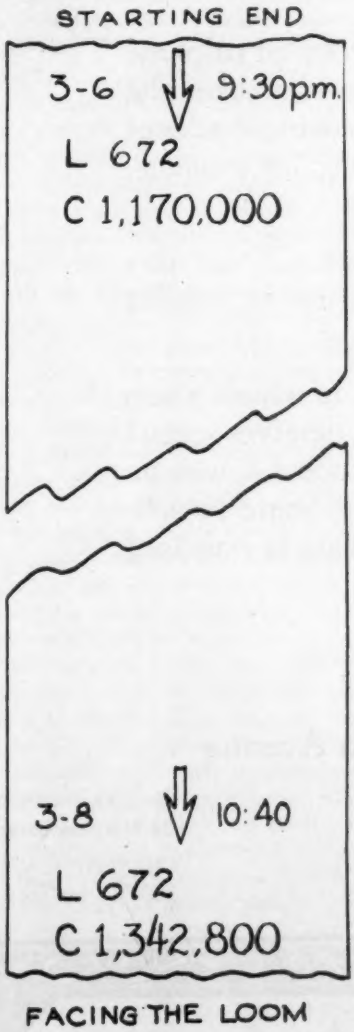
EDITOR COTTON:

How should goods for napping be marked to determine which belongs to the day weaver and which to the night weaver, when operating day and night shifts in the weave room? This is the question asked by "Contributor No. 672" in your April number, and he gives four conditions which must be met. The mark must not be removed during the process of napping. It must not injure the napper rolls, nor detract from the quality, nor make waste. A fifth condition might be added—the mark must show which weaver made the bad work.

There will be no need for this man to change his present system, but a very quick and sure method of doing this is as follows:

All of the cloth which comes off at night should be marked with a different color crayon from that which is used in the day-time. This gives instant indication of when



the cloth was taken off. Now, make a short arrow mark to show on the top side of the cloth as it comes off of the loom, making certain that this arrow points to the end of the cloth just woven. This shows instantly that the cloth was marked right by the marker or the man who makes the cloth.

All of the cloth should be marked so that it reads as one faces the loom. This is important because if the marker turns the roll around or turns it over it will be entirely possible to detect which way the cloth was moving; that is, whether it was just started to be woven or is coming off. The end started on the loom should be marked pointing away from the end. In this way it will always be possible to tell when the roll started at night or by day, as the color will denote this, and the arrow pointting will also be a check on the mark and of the direction in which the cloth was woven. Unless this is done, after the goods are turned around, in the napper room, a few times, it will not be possible to tell which end started first, especially if the cloth is not all marked one way, and so that it will be readable when facing the loom. The arrow is put there as a check on the marker, and shows he noted the direction of the cloth movement from the loom. While this shows clearly whether the cloth comes off at night or by day, it is also well to put on the side of the arrow the time at which the cloth comes off. All of this helps. Even the date should be placed on the other side of the arrow. Lastly, be sure the counter reading is put down. This all must be marked at both ends of the cloth.

The marks on this cloth show, if in yellow, that it was started at night. The time also proves this. The loom number is there, and the date is at the left of the arrow. The counter reads 1,170,000 picks, and at the other end the counter reads 1,342,800, which shows that 120 yards of cloth at 40 picks per inch were taken off two days after started.

If the defects are near either end the bad work was undoubtedly done at night, but if it occurs in the middle of the piece it is only necessary to figure back by the picks, and if the bad spot in the cloth was woven during the day the figures will show that it came between the morning and the night reading of the cloth. Of course where the seconds are low, and a weaver or a number of weavers make good work, it may not be necessary to be so specific. But if it is desired to trap any bad worker and locate the exact weaver, the system outlined gets the bird okeh. Of course, when the clock reading is marked on the cloth, this alone will show about all of the story. But the time, date, arrow mark and dual colors check up on the other things. It indicates at sight where, when and who did the work. No matter how many times the cloth is turned over and around in the napper room, there is no trouble or danger of reversing.

There is still another way by which the weaver can be determined, and that is, where conditions permit, to run a colored thread in the selvage, having one color for day and one for night, or having a colored thread for the night run and none for the day shift.

H.D.M. (CONN.)

A National Advertisers' Number.

The current number of "The Albatross," the quarterly magazine published by The White Company of Cleveland, Ohio, manufacturers of the well known White trucks and busses, is a particularly unique issue. It is full of illustrations, and the 77 companies represented by these illustrations are the owners and operators of more than 9,000 White trucks and busses. It is an issue that provides interesting reading for everyone, and mill managers will find therein many ideas and suggestions of interest.

GDC

Indo Carbon CL

is a member of a special new group of sulphide blacks which possesses the advantage over the ordinary sulphide blacks of producing shades of *excellent fastness to prolonged storing, hot steaming, ironing and acid cross-dyeing.*

The dyeings of Indo Carbon CL are *very fast to washing, boiling, ironing, stoving, alkalies and mercerizing.*

The good *fastness to chlorine,* in which it surpasses all other sulphide blacks, deserves special mention. As a result, Indo Carbon CL may be used for dyeing goods required to stand bleaching in the piece, provided due care is exercised in the method of working.

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GENERAL DYESTUFF CORPORATION

Decreasing Waste With Cylinder Beaters.

EDITOR COTTON:

The general advantages of striker beaters over the rigid or pin type have been discussed at some length in the pages of COTTON from time to time. It is well established that the striker beater will open stock better, and with less damage to staple; it will break fewer motes and less leaf than other types of beater, and thus help to make cleaner yarn with fewer nits, and it will remove a somewhat dirtier mote than the ordinary beater.

It is also claimed that where striker beaters are used exclusively in the pickers that stronger yarn is likely to result on account of the fact that the blows per inch will run only about half as many as with other types, and that the blows being scattered, there is less damage to the staple.

The increasing use of these beaters throughout the picker room has recently brought to light a remarkable and interesting fact. Their use has in many instances made the work run heavier.

This condition when first reported by several mills was thought to be a mere coincidence, but as other persons in widely scattered portions of the country made the same claim, it began to look as if there might be something to it. To analyze the matter, one of the larger mills of the country undertook a comprehensive test which yielded some very interesting information.

This mill had been experimenting with cylinder beaters for some time, and at the time of the test they were operating a line of cylinders consisting of a double-beater breaker and a finisher. Their regular picking process consisted of double-beater breaker, intermediate and finisher; the breaker and intermediate equipped with blade, and the finisher with a carding beater. Experiments had shown that although the cylinders struck only half as many blows as the two-wing, and one-third as many as the three-wing beaters, they took out as much dirt, and the main object of the test was to make a careful comparison of the two-process picking with cylinders as compared with three-process picking with regular standard equipment. That as clean yarn could be made from the same stock with less than one-third the beating in the pickers was problematical, and after trying the arrangement out and finding that the yarn was as clean, it was decided to go into the whole matter very thoroughly and see just what the differences were in the character and amounts of waste made, and to see what were the effects on the weights and breaking strength.

For the purposes of this test, ten cards were set as nearly alike as possible, and five were run on each kind of stock. The cotton was exactly the same in both cases; the only difference being in the picking method. The pickers were fed from an automatic distributor, so there could not possibly be any variation in the character of the cotton in the two lines of pickers. All waste from pickers and cards was collected and weighed each day. The test lasted ten weeks, and was conducted by a thoroughly experienced and competent man.

A test conducted on one or two bales of cotton, or on one or two cards for a day or so, may easily be open to criticism on the grounds of inadequacy. The normal fluctuations in a mill might influence such tests enough to make them worthless, but a ten-card test for ten weeks ought to be reliable. In that time about 50,000 pounds of cotton would be handled under varying atmospheric and mill conditions, and as the two tests were carried on collaterally there is no reason to doubt the accuracy of the results.

A tabulation of this test is given herewith, as well as comment:

TEST NO. 1 "CYLINDER BEATER"

PICKER WASTE

Ending Week	Total	Clean	Leaf & Sand	Invisible	% Clean	% Leaf & Sand	% Invisible	Hours Run
Sept. 31	78 lb	22 lb	55 lb	1 lb	28.2%	70.5%	1.3%	23
Oct. 8	126	47	78	1	37.3	61.9	.8	44
Oct. 16	88	30	56	2	34.1	63.6	2.3	34.5
Oct. 23	114	47	66	1	41.23	57.88	.89	46.75
Oct. 30	76	29	45	2	38.15	59.21	2.64	29.25
Nov. 6	148	59	87	2	40	58.8	1.2	52.75
Nov. 13	120	49	70	1	40.83	58.33	.84	46.5
Nov. 20								
Nov. 27	112	41	70	1	36.6	62.5	.9	40
Dec. 6	134	57	75	2	42.53	56	1.47	50
TOTAL	996	38f	602	13	338.94	548.72	12.34	366.75
Average per week	110.6	42.33	66.9	1.44	37.66	60.97	1.37	40.75

TEST NO. 1 "CYLINDER BEATER"

CARD WASTE

Week Ending	Total	Strips	Fly	% Strips	% Fly	Hours Run
Sept. 31	57.5 lb	23.5 lb	34 lb	40.87%	59.13%	48.75
Oct. 8	141	66	75	46.82	53.18	54
Oct. 16	151.5	76.5	75	50.49	49.51	48.75
Oct. 23	147.5	74.5	73	50.5	49.5	48.75
Oct. 30	104	48	56	46.15	53.85	34.5
Nov. 6	132	65	67	49.24	50.76	54
Nov. 13	115	62	53	53.91	46.01	59
Nov. 20	164	75	89	45.73	54.27	54
Nov. 27	132	67	65	50.75	49.25	39
Dec. 6	250	123	127	49.20	50.80	63
TOTAL	1394.5	680.5	714	483.66	516.26	503.75
Average per week	139.45	68.05	71.4	48.37	51.62	50.37

Tests on both types of beater were made on exactly the same cotton. Two adjacent lines of pickers were used; both fed from the same automatic distributor. One line, consisting of a double-beater breaker and a finisher was equipped with the cylinder beaters completely. The other line, consisting of double-beater breaker, intermediate and finisher was equipped with a three-blade beater in the first section of the breaker; a two-blade beater in the second section, and in the intermediate, and a carding beater in the finisher.

The pickers equipped with the cylinders had been set to take out approximately the same poundage of motes as the other machines. This was advisable in order to get a directly comparable test on each line. If each picker removed the same weight of waste, the results in the card room could be compared without having to make any allowance for the difference in picker room waste removal per

TEST NO. 2 "REGULAR BEATER"

PICKER WASTE

Week Ending	Total	Clean	Leaf & Sand	Invisible	% Clean	% Leaf & Sand	% Invisible	Hours Run
Sept. 31	121 lb	48 lb	72 lb	1 lb	39.67%	59.5%	.83%	23
Oct. 8	183	81	100	2	44.26	54.64	1.10	44
Oct. 16	117	50	66	1	42.73	56.41	.86	34.5
Oct. 24	172	79	92	1	45.93	53.48	.59	46.75
Oct. 30	115	54	59	2	46.95	51.30	1.75	29.25
Nov. 6	223	104	117	2	46.6	52.7	.7	52.75
Nov. 13	176	83	92	1	47.15	52.27	.58	46.5
Nov. 20								
Nov. 27	169	81	87	1	47.93	51.48	.59	40
Dec. 6	232	110	118	4	47.41	51.30	1.29	50
TOTALS	1508	690	803	15	361.68	483.08	8.29	366.75
Average	167.55	76.66	89.2	1.66	40.1	53.66	.92	40.75

TEST NO. 2 "REGULAR BEATER"

CARD WASTE

Week Ending	Total	Strips	Fly	% Strips	% Fly	Hours Run
Sept. 31	65.5 lb	34.5 lb	31 lb	52.67%	47.33%	48.75
Oct. 8	165	92.5	72.5	56	44	54
Oct. 16	149	81	68	54.36	45.64	48.75
Oct. 24	150.5	84	66.5	55.8	44.2	48.75
Oct. 30	110.5	56	54.5	50.68	49.32	34.5
Nov. 6	129	69	60	53.57	46.43	54
Nov. 13	130	74	56	56.93	43.07	59
Nov. 20	170	88	82	51.76	48.24	54
Nov. 27	139	77	62	55.39	44.61	39
Dec. 6	265	142	123	53.2	46.8	63
Totals	1473.5	798.0	675.5	540.29	459.64	503.75
Average	147.35	79.8	67.55	54.03	45.96	50.37

picker. In the actual test, it will be noted that the three-process picking took out just 51.4 per cent more waste than two-process; showing how very nearly the same amounts per machine were removed.

All picker waste was run through a regular picker waste cleaner, and the relative percentages of clean picker, and sand and leaf were calculated. On the cards, the licker-in and fly waste, and the strips were kept separate.

In analysing the figures it will be seen that the relative percentage of total waste for the two lines of pickers is almost exactly accurate. The three-process took 51.4 per cent more total waste. But the three-process took 81.1 per cent more clean picker waste and only 33.4 per cent more leaf and sand. There is a still greater discrepancy in the invisible waste; the three-process line taking only 15.4 per cent more than the two.

These figures show how the cylinders clean as compared with the other beaters, and how much better they open the stock. The regular beaters beat out a relatively high percentage of fiber because they did not keep the sheet of lap well opened. That the cylinders did open up the stock thoroughly is attested not only by the relatively higher percentage of leaf and sand, but by the much greater relative quantity of invisible waste which is almost entirely the impalpable dust that passes out of the air discharge, and which cannot be removed effectively from poorly opened cotton.

The percentages of waste for each line of machines corrected for the difference in the number of pickers in the two lines, shows that the cylinders removed 6.1 per cent less clean picker waste, and 13.6 per cent more leaf and sand.

Since the total picker room waste removal was 51.4 per cent greater with three-process picking than with two, it might reasonably be assumed that the card waste must necessarily be greater from the cotton carrying the greater quantity of waste from the pickers to the cards. Such was not the case however. The cotton from which the most waste was taken in the picker room was also that from which the most waste was taken in the cards. The cotton lapped with the regular beaters lost 5.7 per cent more waste in the cards than the cotton lapped with the cylinders. All of this was strips however; the cotton put through the regular beaters losing 17.3 per cent more strips than the other stock, while the cylinder lapped cotton lost 5.7 per cent more licker-in and screen waste.

This shows that with both picking systems there was very nearly the same amount of heavy dirt removed, so that the sliver was as clean one way as the other, but the cotton put through the cylinders yielded more sliver and less strip waste and clean picker waste than did the other. In this particular case the reduction in waste resulted in an actual increase in production of 2 per cent. This is no theoretical or imaginary increase in production. It is an actual transferrence of cotton from the card and picker waste account to the yarn account, and meant a concrete saving of at least ten cents a pound on two per cent of the mill's product.

A brief analysis will show how logical these results are. The object of picking cotton is to get rid of a certain amount of foreign matter and motes, and to put the cotton in lap form for the cards. Obviously, nothing should be taken from the cotton except unspinnable material, and this should be removed with the least possible injury to the stock. The only practical way to remove the foreign matter is to keep the cotton thoroughly opened up and beat out the heavy waste.

The advantages previously urged for cylinder beaters bore chiefly on the strength and appearance of the yarn, and many mills were led to adopt this type of beater because they could better meet competition by improving the looks of their yarn and getting a better break. The tendency to reduce waste, and thus increase production carries a universal appeal. No yarn is too fine or too coarse to be affected by the possibility of getting more of it from the same amount of raw stock.

M. C. (MASS.)

Winding Yarn on Warper Beams.

EDITOR COTTON:

We would like to open a discussion in "How Other Men Manage" as to the relative merits of the two methods of putting yarn on warper beams. At present we are running our yarn over the beam and find less breakage compared with running it down and under. On the other hand, it is more difficult to find a broken end and harder

to start and stop evenly. We are running 23s yarn.

We would appreciate having some of the readers of COTTON describe how they are doing it, explaining their reasons, and also why they do not use the other method.

Y. M. (S. C.)

Balanced Twist.

EDITOR COTTON:

As the prolonged discussion in COTTON readily shows, it is difficult to give a specific formula for a more or less balanced twist, which "Contributor No. 173" is evidently seeking.

The better and most expedient plan is to experiment with the twist—especially the spinning twist. This course is particularly necessary if the cable of the finished ply is to have a certain appearance, in which case, obviously, the ply twist cannot be subject to any great divergency.

Wet twisting will often bring about a degree of balance that would be impossible to attain otherwise, even with reasonable variations in the twist.

Juggling with the weight of the travelers may bring about trifling changes in balance, but these are usually so insignificant as to be discounted. Again, the ring size has little, if any, appreciable effect on the balance of the twist.

Subsequent processes such as singeing, reeling, winding, mercerizing, waxing, glacing, etc., will often bring about a balance that seems impossible to get in the plied product immediately after twisting.

CONTRIBUTOR NO. 123.

The Term "Tabby" in Designing.

EDITOR COTTON:

It has been very interesting to me to read the article in a recent number of COTTON on the design of bedspreads. I am interested in work of this character and am always glad to read the thoughts and opinions of others.

However, in the article in May, on page 642, the author refers to the "plain weave or tabby," and inasmuch as this term "tabby" is one with which I am unfamiliar, I am writing to ask if you can get your contributor to explain this term a little more clearly. I am of the opinion that perhaps the term is a colloquial or shop term, familiar in some sections of the country and unfamiliar in others. In any case, I shall be glad to learn further about it.

CONTRIBUTOR NO. 201.

EDITOR COTTON:

I have received from you the inquiry of "Contributor No. 201," who asks for an explanation of the term "tabby," as used in the explanation "plain weave or tabby" in my article on the design of bedspreads in the May issue of COTTON. This man stated that he was unfamiliar with this term and that an explanation might be of interest in sections where this term is not used.

I would say in reply that the terms "plain weave," and "tabby" are quite synonymous. The eminent British authority, Watson, in his work "Textile Design and Color," while writing on Plain Weave, says:

"In the trade, such terms as 'tabby,' calico, alpaca and taffeta are applied to plain cloth."

In the upholstery and drapery goods trade of Philadelphia, the word "tabby" is used almost invariably to denote plain weave. It is a very convenient term for Jacquard card-cutting, as "plain weave" is often used in fabrics as a binder on the back of one or more warps or shuttles, and entirely different weaves on the face. When designing for Jacquard fabrics the portions of the fabric woven in plain weave are sometimes painted in a solid color, and the card-cutting directions for that color read: "Cut tabby." The card stamper will have a slip of design paper painted with plain weave pinned at the side of the design, and will proceed to cut the odd keys on odd numbered cards, even keys on even numbered cards on that color. On those designs where the plain weave dots are indicated on the point paper, the card stamper will of course cut the design as painted.

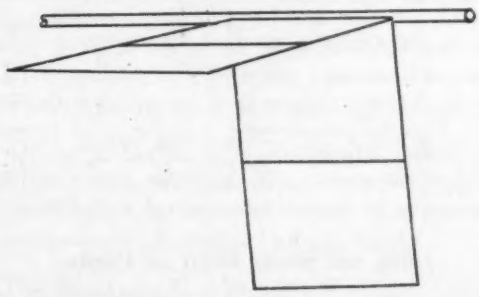
I trust this explanation will clarify the definition of this term for "Contributor No. 201" and any other readers who may not have been familiar with it. If, in the article on designing, I used any further terms that are not thoroughly understood, I hope readers will ask for further definitions.

OSBERT HUGHES.

What Makes the Cotton Roll?

EDITOR COTTON:

We have an opening arrangement similar to that described by "Contributor No. 1029" in the March issue of COTTON. We have our cotton pass through the bale breaker, then through the Whitin upstroke, vertical opener and Murray cleaner. At this point we have a fan which blows the cotton over into the hoppers of the breaker lappers. We have a difficulty which we have been trying to remedy for sometime, and that is that our cotton is somewhat rolled into small rolls that never completely draw out in carding. We have tried speeding up the feed roller on the upstroke and letting the bale breaker remain the same speed. This fed a thinner sheet of cotton to the beater and it struck the cotton less. It helped a little, but I don't believe we have really found the correct cause of the rolling yet. Do



your readers think the fan would cause it to roll. It is a fan that has been used for this purpose before and has never given any trouble of this kind. The fan speed is 1100 r.p.m. It has flat bronze wings as shown in the sketch.

If your readers can give us any light on the subject it will be greatly appreciated. For settings and speeds see the layout in the March issue of COTTON, page 468—"Contributor No. 1029."

We also have trouble with the cotton choking up some in passing to the vertical opener.

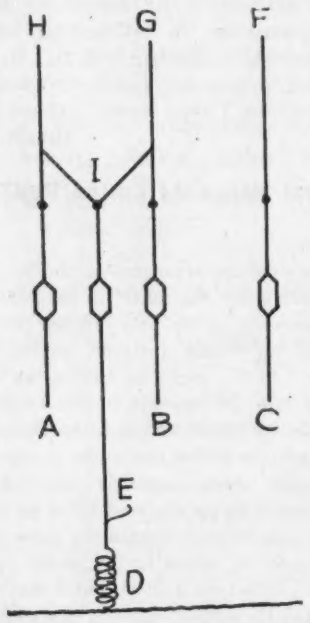
CONTRIBUTOR NO. 514.

Making a Tape Selvage on 3-Harness Goods Without the Use of a Selvage Motion.

EDITOR COTTON:

It is entirely possible to make a tape selvage on a three-harness piece of goods without the use of a tape or selvage motion, and the accompanying sketch will illustrate how this is done. This is written in answer to the question on this subject which was asked at the Spartanburg meeting of the Weaving Division of the Southern Textile Association, as reported in your June issue.

The method for doing it is simple, as will be learned from the accompanying drawing. Put the skeleton harness between the first and second harness. Draw the skeleton



plain with the third harness; draw the outside threads twill. The skeleton is held on the bottom by a spiral spring and is connected with a string to the top roll straps on the first and second harnesses.

In the drawing, *A* is the front harness, *B* is the center harness, *C* is the back harness, *D* is the spiral spring, *E* is the skeleton selvage harness, *F*, *G*, and *H*, are the top roll straps, and *I* are the strings which connect the skeleton harness to the top roll straps. P. T. S. (MAINE).

Long and Short Draft on Cards.

EDITOR COTTON:

Replying to "R. N. (N. C.)" in March COTTON concerning which is the better layout for cards, 117 draft using 12 ounce lap, or 140 draft using 16 ounce lap, the finished sliver to weigh 52 grains.

Allowing 7 per cent of waste at the card, the sliver cannot possibly weigh 52 grains under these conditions.

$$\frac{437.5 \times 16 \times .93}{140} = 46.5 \text{ grains per yard.}$$

$$\frac{437.5 \times 12 \times .93}{117} = 41.7 \text{ grains per yard.}$$

To use 117 and 140 for drafts and still obtain a 52 grain sliver, heavier laps must be used.

$$\frac{52 \times 117}{437.5 \times .93} = 15 \text{ ounces.}$$

$$\frac{52 \times 140}{437.5 \times .93} = 18 \text{ ounces.}$$

These laps are too heavy.

I presume that "R. N. (N. C.)" merely stated his conditions to illustrate the principle involved and did not figure them through to see that they balanced.

In answer to the long and short draft question, I will say, use a draft as close to 100 as possible and still maintain the weight of lap necessary to keep up picker production. A 13 ounce lap is my idea for American cotton.

$$\frac{437.5 \times 13 \times .93}{100} = 52 \text{ grain sliver.}$$

I recently changed my cards from 132 draft using 14½ ounce lap to 103 draft using 13 ounce lap with a marked improvement in quality and breaking strength.

In studying this interesting question I ran across some figures which had never occurred to me before. I wonder if any of the readers have ever figured just how rough an old fellow the licker-in is. If there are 33,600 teeth in a 40-inch licker-in and it makes 425 r.p.m., can they realize that 14,280,000 teeth pass through the cotton delivered by the feed roll. The following table gives some interesting facts:

Draft	Weight of lap	Draft gear	Inches fed per minute	Ounces of cotton per minute	Teeth per minute 425 r.p.m.	Teeth per inch of cotton delivered	Teeth passing through each ounce of cotton	Teeth passing through each grain of cotton
102	13 ounce	23	23	8.30	14,280,000	620 000	1,720,000	3,930
117	12 ounce	20	20	6.66	14,280,000	714,000	2,140,000	4,900
140	16 ounce	17	17	7.55	14,280,000	840,000	1,890,000	4,325

I should like to know what the readers think about this?

S. H. (N. C.)

EDITOR COTTON:

In reply to "R. N. (N. C.)" who asked in the March issue for the comparative advantages between long and short drafts, on cards, I would like to advise him to use a light lap with the short drafts. We get the best breaking strength from that layout.

I ran a test some few weeks ago using an 18 ounce lap with a draft of 150 and my breaking strength was two pounds off on the long drafts. I am sure if he will run a test he will find the same result.

Referring to the test, my lay-out before I made the test was a 12½-ounce lap with a 102 draft, with a card sliver of 52 grains. The card settings were: feed plate to licker-in, .017; flats to cylinder, .010; cylinder to doffer, .007. The average breaking strength on 30s yarn was 52 pounds, using Strict Good Ordinary cotton.

For the long draft test we used an 18-ounce lap with 150 card draft, as stated, and a 52-grain card sliver. We did not move any card settings. The breaking strength averaged only 49.8 pounds on 30s. The staple of the cotton is one-inch.

H.H.H. (S.C.)

EDITOR COTTON:

In reply to the question of "R. N. (N. C.)"—"Which is the better layout for cards, a 12-ounce lap with a short draft, say about 117, or a 16-ounce lap with a draft of 140 finished sliver to weigh 52 grains?"—I should like to express some convictions I have formed concerning card drafts, and in this way add to the information on which "R. N." will base his decision between the two drafts in question.

Using a 12-ounce lap to make a 52 grain sliver will require a draft of 100.9., arrived at by converting the weight of one yard of lap in ounces to grains and dividing the result by the weight of one yard of sliver in grains as follows:

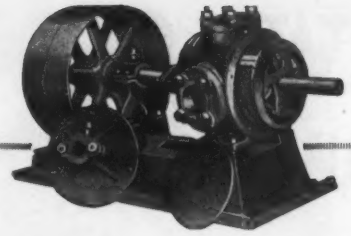
$$\frac{\text{Grains} \quad \text{Ounce}}{\text{52 grains}} = \frac{437.5 \times 12}{52 \text{ grains}} = 100.9 \text{ draft.}$$

If we use a 16 ounce lap to make the same weight sliver we find from the same method of calculation that it will require a draft of 134.6. In neither case has allowance been made for waste which of course would lessen the draft as calculated.

Draft as is used on most cards today, is as it happens to be, more for the purpose of keeping the weight of the lap and sliver within the bounds of economic reason than for the merits that may be obtained by any special length of the draft itself. However, is is obvious to any practical carder that the lap should pass under the action of the licker-in at a speed sufficiently slow to allow the licker-in adequate time to complete its work of cleaning and combing before the fibers leave the bite of the feed plate and feed roll to pass on to the cylinder. As we increase the draft of a card we decrease the speed of the feed roll, thereby allowing the licker-in to function longer on a given length of the lap, while if we decrease the draft the result is the reverse, that is the feed roll is speeded up, and the lap is allowed to be acted on by the licker-in for a shorter interval. If we can accept these obvious conditions as true we must be convinced that our draft should be so regulated as to permit the maximum cleaning and combing by the licker-in without allowing the fibers to dwell under its action sufficiently long to become chafed and as a result weakened in tensile strength. Just what a card draft should be to accomplish these results would be a well known factor were it not for the wide diversity of production per card being secured in different mills; as we know the production of the card is varied by varying the speed of the doffer which in turn makes a like variation in the speed of the feed roll.

If "R. N." will use the 12-ounce lap it will require a draft of 100 to produce the desired 52-grain sliver then he will find that varying his production one pound per card per hour will have more influence on his work than any other change he can effect, and he will experience no difficulty in cleaning nor appearance of weakening the fibers with the production near ten pounds per card per hour. I infer from the weight of the card sliver that "R. N." is not on fine yarns.

Though it is not in direct reply to "R. N.", I should like to add just here that a majority of the mills could improve the running of their work by lengthening the draft on their cards, provided the weight of the lap is not changed, as the result in this case would be a lighter sliver which



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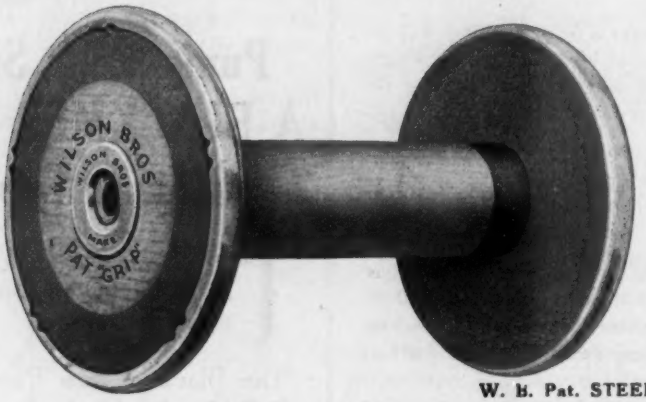

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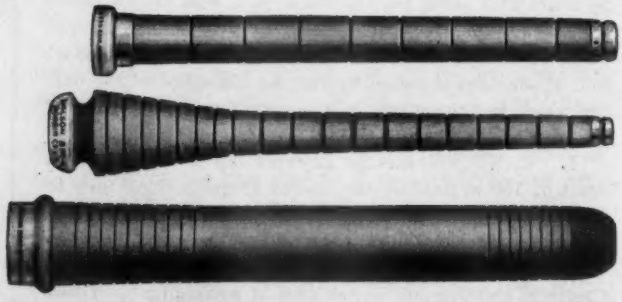

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would permit the reduction of drafts on subsequent processes. The improvement would be effected by virtue of the reduced draft on drawing or roving frames and not by the card draft. Quite often the lengthening of card drafts has received credit for some noticeable improvement in quality of work, when the real cause was due to one or more of the additional changes which the lighter sliver necessitated on other machinery.

Draft is a most important factor when applied to drawing, roving and spinning frames, because of the narrow range its dangers limit the reduction of the stock at each process. The term "draft" is used more to designate the ratio of the weight of a unit length of the product delivered by a machine to the weight of its equivalent length of the product fed rather than to attenuating the fibers, which is an ancient definition, but this has come about by convenience of the term in our work. However, when we consider sliver or roving being reduced at an invariable ratio between the bites of two pairs of rolls, without severance at any point, we have an entirely different picture from that presented by the card where the fibers are combed from the lap by the licker-in and taken from thence by the cylinder in a fine mist where they have no connection with any attenuating element.

H. R. (N. C.)

What Causes the Wavy Places?

EDITOR COTTON:

We are having trouble in our sheeting with a wavy appearance. The weave is irregular and is nothing like as smooth and even as it should be. The weave has the appearance in places of small draw-backs. The places marked in pencil will show this upon close examination of the accompanying sample.

Our first thought was that this was caused by an uneven let-off, but tracing it down, we found that such was not the case. It has occurred to us that possibly the harness settings accounted for the defect, but so far we have been unable to remedy it.

It is entirely possible that this trouble is being caused by excessive boiling in the kiers or bleaching. It may be that the liquor being forced through the cloth is moving the filling threads, causing what is sometimes spoken of as shaky filling. The defects are slightly noticeable in the gray goods. The finishing magnifies them.

Any information any reader can give as to the probable cause of this wavy appearance will be appreciated.

S. A. E. (N. C.)

PHILLIPS B. MARSDEN, superintendent of Howard Bros. Mfg. Co., Worcester, Mass., returned on board the S. S. Leviathan on May 31st from a month's trip abroad, having sailed on the same ship on April 30th. The trip was of a business character to England and France, in connection with the card clothing and other products of his company. While in Paris, Mr. Marsden attended a luncheon given for Colonel Lindbergh, and saw the flyer start from Paris to Brussels. Mr. Marsden reports foreign business conditions similar to those in this country, prospects looking better as is the situation here. While on the Continent he visited battlefronts, Versailles and other points, and he also spent a few days in London visiting points of interest.

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Why Mote Knives Break.

EDITOR COTTON:

What causes the mote knives to break on cards? That is the question asked by "T.N.(Mass.)" in your April issue. There are quite a number of things that may be suggested to prevent the breakage of mote knives. First, I would suggest that the setting of the knives be thoroughly investigated, and experiments made with the top knife at a 12/1000 gauge and the lower knife at 10/1000. While setting these knives, the licker-in should be turned both ways while the gauge is between the knife and the licker-in; if there is any play in the licker-in bearings these bearings should be repaired. These are suggestions of precaution.

Then the bearing on the feed roll is the next to be investigated. If this is too dry it may be the cause of the roll not turning smoothly. Perhaps this feed roll bearing may be worn somewhat; and if so, it should be repaired. Oil channels should be cut in these bearings so that the oil will travel the full length of the boxes. Also, feed roll bearings must be properly set down into the slots and the bases of the slots kept free from dirt. This will assure a perfect contact of the feed roll on the surface of the feed plate. All levers and weights should be inspected to assure perfect action of the feed roll while the cotton is being fed to the licker-in.

After all of these things have been done, and the man feels that nothing more can be done about the card, let him go into the picker room and remove all the thick places from the laps. I think the main cause of his mote knife breakage will be found here. Sometimes when the pickers knock off for a full lap the clutch stays in mesh a fraction of a second longer than it should, or in other words the feed doesn't release the instant the knock-off lets go, and because of this action the cotton is fed upon the cage at that particular interval enough to form a thick place in the web upon the cage. Perhaps not to a great extent, but maybe just enough to cause the trouble at the card, for when this thick place in the lap presents itself at the feed roll, the extra thickness crowds by the mote knives, springing them enough to break them. This thick place may be detected at the picker by watching the levers that hold the calender rolls at the head, for they will raise very abruptly and drop with the same suddenness, showing that thick places are passing between the rolls. Then again, there may be some aprons on the back of the finisher or intermediate pickers that are slipping, allowing the feed to be broken and started in such a manner as to create an uneven lap, which causes the trouble at the cards. These aprons should be kept in good repair at all times and never should be run slack. The evener shoes that press the cotton against the feed roll should be kept free, also all worn hooks and levers should be taken out, commencing at the evener shoe and continuing back as far as the cone on the side of the pickers. Also, all gears must be meshed properly, avoiding any slippage.

I think if the foregoing suggestions are carried out, "T.N." will have no trouble with broken mote knives and brackets. I hope he will try them out and let the readers know how he finally comes out.

T.O.M.(MASS.)

EDITOR COTTON:

In response to the question of "T.N.(Mass.)" with reference to mote knives in the cards breaking.

The way his question reads, he just mentions the knives breaking, but I rather think that his mote knife bracket breaks first, as I do not ever remember having but one set of mote knives to break, and that was when the wire on the licker-in came loose and broke the set of knives out.

However, I have had several brackets to break, and if "T.N." takes his brackets to the vise and files the rough places out of the slots so that both knives will go on freely the same way on both ends, and when bolting them to the cards see that they are free and not binding, he will not have any more knives to break. He says that he has as many as eight in a week to break. His mote knives are binding and are in a warped or sprung position in the bracket. I file the slots in my brackets to where the knives will slip on and off freely, and when I tighten the brackets to the cards I see that the knives are not binding. I have not had a bracket broken in over a year, and if "T.N." will try this, I am sure it will help him, and I would like to hear from him later as to his results.

W. C. H. (GA.)

EDITOR COTTON:

A most unusual question appears in the April number of COTTON, signed "T.N.(Mass.)", in reference to information regarding causes of mote knives breaking under very unusual conditions, according to his statement.

Judging from these conditions, I am taking it for granted that after grinding these cards, the knives, or any part of the card back, is not disturbed in any way, and so we have a condition of a card just ground and say just the doffer set to the main cylinder.

However, that is what I have in mind while dealing with this question, and also that any kind of tampering with these cards on the part of anybody is strictly watched.

According to our friend's letter, he must be experiencing a wholesale breakage of mote knives. He states that when a card is started up after grinding and the lap is put through, while waiting for the web they hear a bang!, and lo, and behold, the knives have broken.

Funny, to say the least of it. Still, I should like to ask "T.N." how the lap is put through in this case and if it is turned in by hand, to save time, the result being a large tuft pulled away from the feed plate and roll, which might prove too much for the knives?

Mentioning the foregoing, I have in mind the fact that some mote knives in different makes of cards are made what I term "solid", that is, they have little, if any, "give" in them, and are more likely to snap than are others which have the necessary spring or "give" in them.

However, I notice this contributor says that most of the knives break "at any time", probably an average of at least one every day. Now with 75 per cent of new lickers-in, as he claims to have, which undoubtedly must be all well set up, it seems almost impossible for the knives to keep breaking, being set to a 10/1000 guage.

I have the top knife set to 10/1000 and the bottom to a 7/1000, and I never experience the trouble "T.N" is having. Still, there is something wrong, and I am wondering if he is sure that all the feed plates are set up properly and the feed rolls running freely, and also properly weighted on both ends? If not, of course he will get many sudden bangs at the back of the card.

Another thing. How about the licker-in speeds? I

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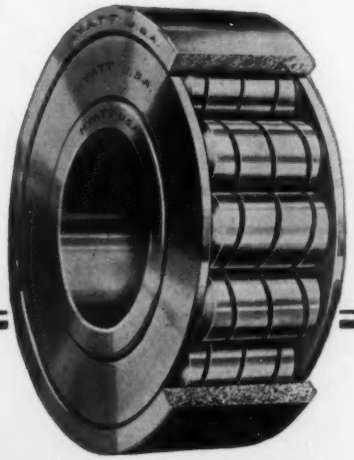

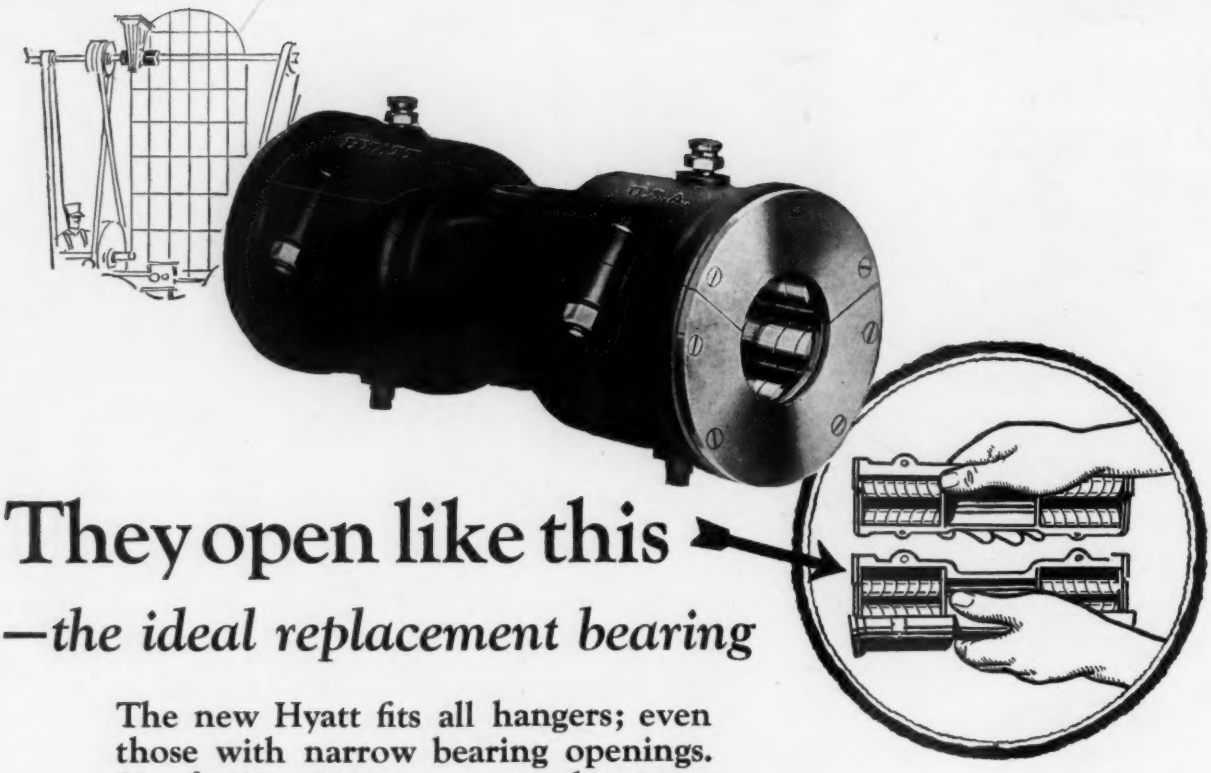

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wonder if those belts are tight enough. No loose pulleys on the licker-in or the end which is driven from the cylinder especially. And I wonder if "T.N." is sure that his laps are being made even, yard for yard, and are being produced in as clean a condition as circumstances will allow?

All these little points may help this contributor to think of a remedy for his difficulty, as of course he knows the make of the machines on which these knives are breaking, and probably they may be set solid, as I previously stated, and this is surely detrimental in cases where heavier laps are being fed, or unusual conditions occur.

Again, perhaps "T.N." would do well to take the backs down and examine the knives for rough edges, and if any are found, smooth them, and in replacing them, see that they do not fit too tightly in the brackets. Give them a little "play", and be assured that they are set properly. I say "give them a little 'play' ", as I seem to think that these knives must be fitted too rigid, and any sudden jolt is likely to do the damage.

Anyhow, I hope that I have helped to enlighten "T.N." on some little point concerning this problem, and will be very pleased to hear if I have.

D. E. (R.I.)

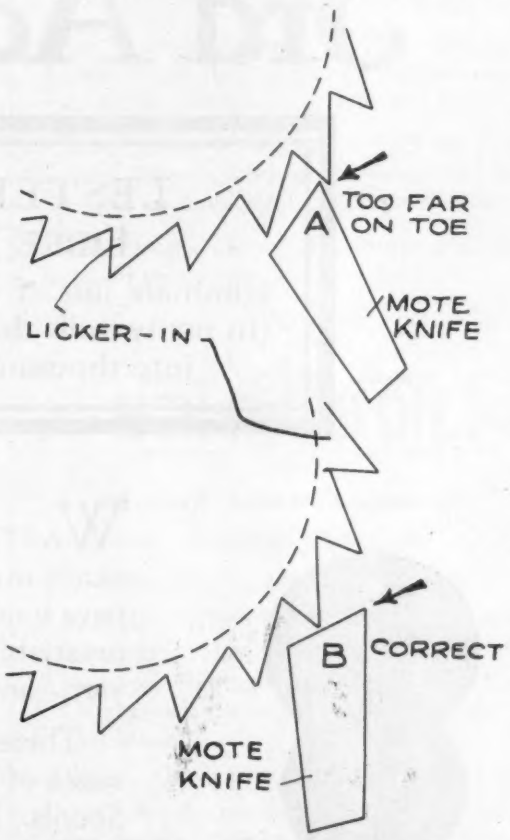
EDITOR COTTON:

I notice in your April issue that "T.N.(Mass.)" is having trouble with his mote knives breaking, and I thought that I might help him out as I had a somewhat similiar experience a couple of years ago. Some new cards were put in our mill, and the first group started up gave a great deal of trouble breaking mote knife brackets. I suppose that they broke first, being weaker than the knives. After a great deal of investigating we found the trouble to be that the knives were set too far on the toe or point, and every time a lump would come though in the lap the knife would be drawn up against the licker-in, and being too far on the toe, would lock the teeth of the licker-in over the top of the mote knife, and something just had to break. The accompanying sketch will show what I mean. At *A* we see the knife drawn against the licker-in and the teeth locked over the knife. Of course it is understood that the knife is not set against the licker-in, but when a lump comes over that will not pass through the opening between the knife and the licker-in, it will hang on the top of the knife until the teeth take hold of it and as it jerks through it pulls the knife up against the licker-in for a fraction of a second—just long enough to hang up and break.

If the knife is set a little further on the heel, as in *B*, when a lump comes through it can be readily seen that although the knife is drawn up against the licker-in as before, the top edge of the knife is out of the way and no damage is done. I have always made it a point, when setting mote knives, to turn the licker-in slowly by hand in the direction it runs, and by placing the thumb on the middle of the mote knife and pressing against it, force the knife against the licker-in and find out "for sure" if it is going to hang or not.

Now, don't think that this will affect the working of the mote knives, for it will not. If anything it helps them, for if the knives are too far on the toe they will take out some fly and white cotton, and the further on the heel they are the less fly and long staple they will take out.

We were required at one time to eliminate as far as possible the fly from under our cards, and by setting the knives close and well on the heel, together with making a close setting of the licker-in screen, we were able to cut down until all that came out from under a card in a day's run would go in a gallon pail and be practically all motes. It took close and careful setting to do this, but it was done.



We found in doing this that the main difficulty was in the mote knives and overcame it only by setting them well on the heel.

I hope that the foregoing will be of help to "T.N." or somebody else, and if anyone has any difficulty in cutting down to the required amount of fly I might be able to help them by giving our settings in full which I would be glad to do on request.

CONTRIBUTOR NO. 641.

Adjusting the Atherton Picker.

EDITOR COTTON:

In reference to the inquiry of "W. H. T. (Mass.)" who wants to know about the "adjusting screw for scale motion" of the Atherton picker, I wish to give the following information:

The adjusting screw for the scale motion on the Atherton picker corresponds identically with the fulcrum of the evener motion on the Kitson picker. The function of the fulcrum of the Kitson picker evener is to vary the amount of motion of the quadrant with each variation of the evener fingers.

The best method that I know of is to adjust this leverage, which is given by the adjusting screw for the scale motion, is to run a lap with four laps on the apron. Weigh

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Increase about 10% the yardage on your spools.
Eliminate warper kinks and knots due to spools.
Eliminate broken ends on your warpers due to spools and thus increase warper production 20% to 30%.
Materially improve the quality of your warps; and thus better the quality and increase your production generally.

WASTE of yarn due to the breaking of spool heads is a common occurrence in mills using ordinary spools. When the spool head breaks, it almost invariably does so when the spool is loaded with yarn—and the salvage is practically negligible.

There is a proven method of preventing this waste of expensive yarn. It is the use of Lestershire Spools. Lestershires soon pay for their cost on this one item of yarn saving, and the years of extra life represent clear profit.

The heads of Lestershires are made from a grade of fibre especially manufactured for us. Only the best of this fibre is used for Lestershire Spools—the fibre that meets the rigid specifications adopted for these spools. That means spools that last the life of your machines.

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the resulting lap. Now without touching anything, run only three laps on the apron and see what it weighs. If the evener has not compensated for the missing lap then it is necessary to adjust the "adjusting screw for the scale motion." This is the reason this adjusting screw is put there. Some cottons have a heavier density per cubic inch of mass than other cottons. As we know western cotton has a higher mass density so that this adjusting screw for the scale motion would have a different setting for this kind of cotton than for cotton from the eastern belt. In short, this screw should be adjusted so that it will give the same weight lap with three laps on the apron as with four laps.

O. P. Q. (N. C.)

EDITOR COTTON:

"W. H. T. (Mass.)" has sprung a good one by his question concerning the operation of the Atherton evener motion. It takes me back to the year 1912, for since that time I have never laid eyes on an Atherton picker.

However, there is no difference in the operation of an Atherton and a Kitson evener picker motion. The principle is the same on both. I hope "W. H. T." remembers that on the Kitson picker finisher lapper the scale numbers over the cones casing, thus, 2—3—4. This means that for the doublings of laps, the cone belt should be positioned or run as nearly as possible opposite these numbers. Scale means layers. So it is the same with the Atherton picker motion.

Should there be a break-down on the intermediate lapper making it necessary to run the laps from the breaker picker, the space required could not be decreased from four to three laps by the thumb-screw adjustment. Therefore, the space required is decreased by the turn screw and the space adjusted so as to leave the same leeway for adjustment on the thumb-screw as before.

After the setting is found to be the proper one, then the evener is locked at the required position by the locknut.

WASH (R. I.)

Weaving Cord Ends.

EDITOR COTTON:

In reply to "F. T. (Conn.)" asking for assistance in his weaving problem when running patterns on the looms with colored ends weaving four in a dent, will say that I have had a lot of experience in this class of work on English looms, both in domestic goods and export goods. I take it that he is running the colored ends from the same beam as the ground warp and that they have been put onto the beam at the slasher.

No matter how the warp is made, one cannot successfully make a good job of cord ends unless they are run from a separate (top) beam and the let-off adjusted by means of a rope or preferably a strap made from chrome picking band, which latter is more pliable. The beam must be light in construction.

Sometimes these cord ends are only few in number and I have often, in placing the warp on the beam, had extra tension placed onto the ends forming the cord, that is when the cords are running from the same beam as the ground warp, and when in the loom have had these ends running under a rod slung beneath the ground warp just in front of the back rest or rail. The cord ends must not run through the lease rods, and the shedding must be

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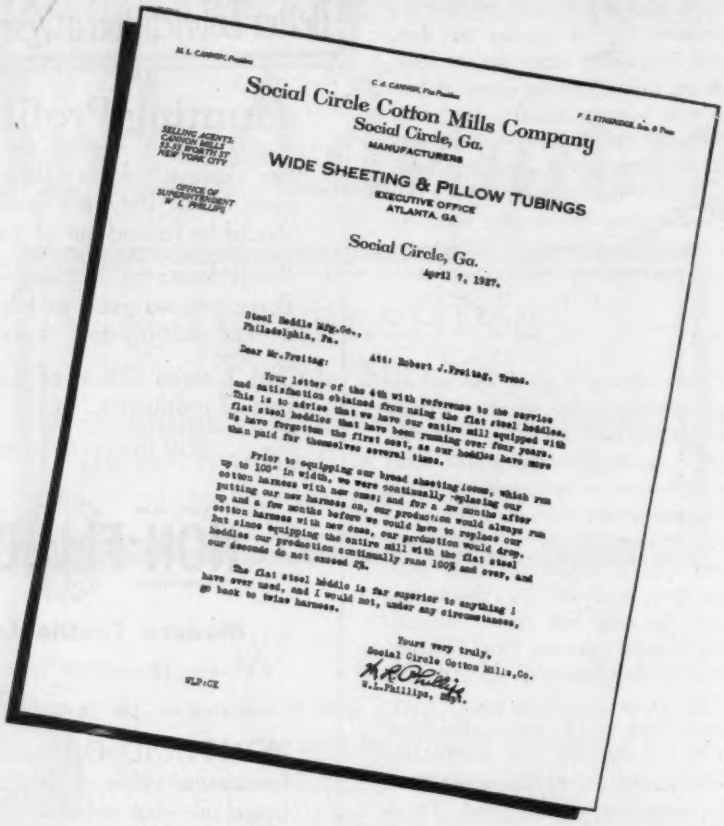

Social Circle Cotton Mills Company
Social Circle, Ga.
MANUFACTURERS
WIDE SHEETING & PILLOW TUBINGS
EXECUTIVE OFFICE
ATLANTA, GA.

Social Circle, Ga.
April 7, 1927.

Steel Heddle Mfg.Co.,
Philadelphia, Pa.

Dear Mr.Freitag: Att: Robert J.Freitag, Treas.

Your letter of the 4th with reference to the service and satisfaction obtained from using the flat steel heddles. This is to advise that we have our entire mill equipped with flat steel heddles that have been running over four years. We have forgotten the first cost, as our heddles have more than paid for themselves several times.

Prior to equipping our broad sheeting looms, which run up to 100" in width, we were continually replacing our cotton harness with new ones; and for a few months after putting our new harness on, our production would always run up and a few months before we would have to replace our cotton harness with new ones, our production would drop. But since equipping the entire mill with the flat steel heddles our production continually runs 100% and over and our seconds do not exceed 2%.

The flat steel heddle is far superior to anything I have ever used, and I would not, under any circumstances, go back to twine harness.

Yours very truly,
Social Circle Cotton Mills,Co.
W.L.Phillips, Supt.

WLP:CE

—a remarkable letter!

In all our experience we have never received a letter which so accurately and so concisely stated the case for Flat Steel Heddles.

Note the following: "We have forgotten the first cost—our heddles have paid for themselves several times—since equipping our entire mill with the flat steel heddles our reproduction continually runs 100% and over and our seconds do not exceed 2%—the flat steel heddle is far superior to anything I have ever used—I would not under any circumstances go back to twine harness."

Could anything be more convincing?

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(Nickel Plated, Copper Plated or Plain Finished).
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IMPROVED LOOM REEDS
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BEAMER HECKS
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COMBS

evenly distributed.

The same method can be employed when weaving cloths with a 2, 3, or 4 pick stitch, but this depends on the fixer when "gaiting" the loom. I have seen fixers who could start up the warp without the least trouble, and others could never make a success of it. A great deal depends on the delivery of the warp from the beam to the healds. The best in my opinion, and I suggest this from practical experience, especially if the loom has a long sweep of the crank, is to bracket the beam out and keep the back rest as low as possible, giving an inclined delivery to the healds.

From a superintendent's point of view, I prefer a separate beam. There is less trouble, a more even cord and the cloth is less likely to "cockle" in finishing, because of the more even weave.

I trust this will be of some assistance to "F. T."

C. W. (CANADA).

Duties of an Assistant Superintendent.

EDITOR COTTON:

I hope the question by "J.R.W." in the March issue of COTTON will bring a big crop of answers. It is an interesting subject.

"What are the duties of an assistant superintendent?"

Briefly, to do the work the superintendent is too busy or too lazy to do. Assistant means one who helps. Therefore, the assistant superintendent is one who helps the superintendent. The duties and opportunities of the job are unlimited and vary with local plant conditions and more particularly with superintendents. Assistant superintendents are usually required in large single units or where several small units are under one superintendent.

There is an endless amount of routine and detail which every superintendent is willing and glad to unload on the shoulders of a capable assistant, such as production schedules, efficiency, size reports, help to be hired, housing conditions, payrolls to watch, shipping, tests and experiments, supplies, etc. Much of this falls to the lot of the assistant. The assistant can check and file routine reports, passing only those of exceptional character along to the superintendent. This is as it should be, for it relieves the superintendent of the smaller details and allows him to keep his mind fresh for the larger problems of plant management. This is the case only, however, if the assistant is made of the right stuff, as a poor assistant will double the worries of the superintendent.

This brings us to the second question, "What are the qualifications of an assistant superintendent?"

Youth, ambition, energy, dependability, accuracy and willingness to do and learn—eagerness expresses the attitude better, but the eager ones are hard to find. These are some of the important qualifications necessary. If he possesses these characteristics he is the man for the job, regardless of his mill experience. A textile school education and a reasonable seasoning in the mill will add greatly to the value of the assistant superintendent, however.

I mentioned youth first. The assistant should be a young man. Ambition is essential to keep up his courage and interest, as the work may become monotonous and discouraging. Dependability and accuracy are all important. For instance:

I'll Show You the Loom That's Losing Out!

It requires no highly trained powers of deduction, or detective ability, to ferret out the loom or looms that are not producing 100% when you pay each weaver by means of Root Pick Counters.

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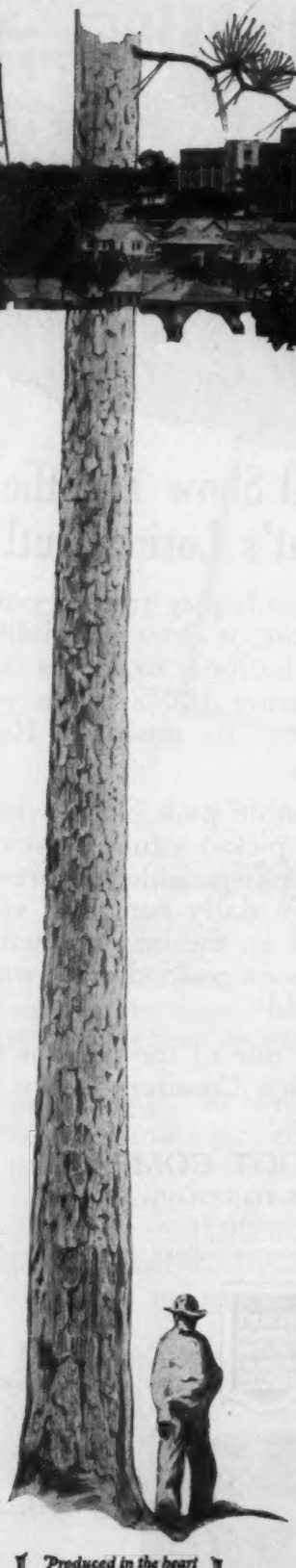

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Pictured above is the new Pacific Mills at Lyman, South Carolina. Approximately 500,000 feet of Creo-pine sub-flooring and timbers were used in its construction. This fine mill is typical of the many new Southern plants for which the architects and engineers have specified Creo-pine.

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"John, what is the front roll speed on our slubbers?"
"180 r.p.m."

The superinendent figures his change only to find that John was wrong and his figures are wasted. The speed was 170 and his production is too low based on 180.

Nothing will kill an assistant more quickly than inaccuracy in his reports.

To be the assistant to some big capable superintendent should be the ambition of every textile student with an eye to the future. Fortunate is he who lands such a position, for he will find himself in a position to gain much intimate knowledge of mill management, and he should not fail to fill his note book. Notes made at this time will be invaluable in the future.

S.H. (N.C.)

EDITOR COTTON:

Answering "J. R. W. (N.Y.)" concerning the duties of the assistant superintendent, will say, the duties of such a position are:

To relieve the superintendent of the minor details. The assistant should be capable, having the necessary training, to instruct the foremen of the various departments as to the methods of improving their products and departments; he should be able to command and hold the respect and confidence of the foremen and minor help, proving to them that he is a man worthy of the position he holds; he should be so capable that should the superintendent be away at any time he can go ahead and take charge for an indefinite period.

In whatever line of manufacture he is acting as the assistant he should be a man fully qualified, having the necessary experience and executive ability, to go ahead and run things as they should be run.

It is most embarrassing to any manufacturer to have an executive who is lacking in experience, ability, tact and "punch".

Further, I would say that an assistant superintendent should be a man with a good personality and master of all the details of his work and fully able to cope with the different problems as they arise. In fact, the assistant superintendent should be so qualified, that if necessary, he can assume the responsibilities and title of the general superintendent.

BOB (CANADA.)

An Opinion on "Buck Passing."

EDITOR COTTON:

I was quite interested in reading what "W. C. (N. C.)" had to say in a recent issue of COTTON about "Passing the Buck"; also, the opinion of "Contributor No. 426" on "Where a Good Man Counts."

I wonder if I might say just this: A man who will pass the buck is never the right man for the job. No matter how well he knows his job, he is lacking in the finest qualities that go to make up a real foreman or overseer.

Let's go back and read this article by "W. C." on passing the buck and that of "Contributor No. 426" on where a good man counts, then take a little inventory of ourselves and see where we stand. We should remember this: A man who will pass the buck will lie. An overseer who can't take the blame for his own mistakes should not have the responsibility of looking after and training other folk.

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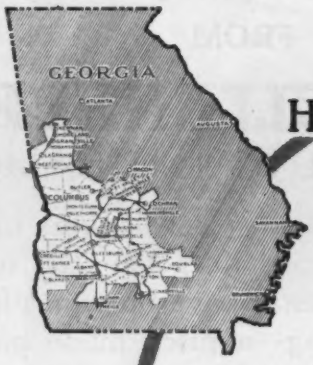

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A superintendent who permits this kind of a man in his plant needs a little inventorying too. X. X. (GA.)

Printed Tapestry Cloth.

(Editor's Note—We recently received a sample of tinted ground, linen tapestry cloth which had been block printed, or, if machine printed, it had been intended to imitate block printing, or perhaps it was sieved or spray printed. We submitted it to two well-known figures in the finishing field; one has furnished a method for securing the finish on linen, while the other gives formulas and systems for reproducing the finish on printed cotton goods. Their letters follow.)

EDITOR COTTON:

This style of work (described above), especially on linen, should be printed with fast colors, either Alizarines or vat colors. The goods are well bleached in the customary manner, run through the water mangle with high pressure and dried. If intended to print with Alizarine colors the goods are padded with: 50 gallons of water; 4 gallons of Turkey red oil; 2 quarts of ammonia; 2 pounds of tin crystals.

After padding, the goods are dried and the colors printed, after standing several hours they are steamed at 10 pounds pressure, then washed off in the open soaper and finally soaped off in the same machine continuously. The goods are now tinted with: 50 gallons of water; ½-ounce Toluylene orange on the padding machine, and then dried. The goods are starched slightly with 50 gallons of water, 3 pounds Eclipse I, and four pounds of Monopol oil.

The goods are dried on the cans and then conditioned on the dampening machine. If a beetling machine is available the goods are given a slow run on each side of the goods in order to get the flat finish. Finally the pieces are given a run on a three- or five-bowl calender with high pressure. In case a beetle machine is not available a beetle calender can be used. If Alizarine colors are not used in printing, then vat dyestuffs are used, and the ground can be tinted with vat colors instead of Toluylene orange.

CONTRIBUTOR NO. 2606.

EDITOR COTTON:

It occurred to me that it might be interesting to your readers to have a discussion on the method of reproducing a printed linen finish (described above) on printed cotton goods, and so I will outline in this letter a method of doing this which I have found to be practical.

In the first place, of course, the goods should be mercerized prior to bleaching or prior to printing. After printing they should be run through a finishing mixing of about the following formula:

For a 200 gallon make there should be used: 75 pounds white dextrine; 40 pounds of 25 per cent sulphonated tallow; 15 pounds paraffin wax, thoroughly melted in water hotter than the melting temperature of the paraffin. This emulsion should be added to the making after the making is at a temperature hotter than the melting temperature of paraffin and the making should be kept at such temperature until used, to prevent the separation of the paraffin. This will require a steam coil in the starch mangle box.

The goods should be immersed through the making in the starch mangle, then passed through the nip, then run over three to six lapped dry cans, thence onto a hot box tenter frame. This, of course, means these three elements are to be driven in range.

After batching at the end of the tenter frame the goods should be lightly dampened and conditioned, then they should be chased on a 5-bowl chasing calender threaded four times around.

I think the readers would find that if the proper cotton gray goods are used this finish will approximate the appearance and hand of a printed linen finish, although it might be necessary to modify the formula one way or another to get an exact match.

CONTRIBUTOR NO. 2607.

Doubling and Drafting Carded Yarns.

EDITOR COTTON:

Commencing at the breaker picker, and continuing until the spinning frame is doffed, we are always up against the proposition of doubling and drafting.

Doubling and drafting go under several appellations. To the practical carder it is his "hang-up"; to the superintendent it is known as his "lay-out" and when we get to the fancy glass door, with the word "Private" painted across the flowered window we find the treasurer refers to the "Organization". But call it what you will, it is still doubling and drafting. It isn't a vocation, comparable to speeder fixing or card grinding. It is an art with a capital A.

The art of doubling and drafting is the most important factor in the operation of a cotton yarn mill. On it depends the appearance of the finished product and the breaking strength of the yarn. Also, the very important item of cost per pound is controlled very largely by the proper manipulation of drafts.

The cost of production makes or breaks every textile organization. The art of drafting almost wholly controls the cost of production, insofar as machine costs are concerned. Therefore, who can deny that the art of doubling and drafting is a *very* important factor in the success or failure of a cotton yarn mill?

When laying out the doublings and drafts for the various machines throughout the plant, from the picker room to the spinning inclusive, several factors must be considered. The quality of the yarn, whether it must be clean and strong and present an even appearance, or whether it will go into some such product as flour bags, cement bags, etc. The number of processes of picking, drawing and roving must also be considered.

The weight of the lap made and the weight of the slivers and roving should be controlled wholly by the quality and counts of the yarn.

When running medium counts, using American cotton, the weight of the laps taken off the finisher picker should be between 12 and 13 ounces to the yard. For fine counts the card laps should be reduced to about 9 to 11 ounces per yard, and the sliver reduced in proportion.

Having decided on the proper weight lap to use, the number of machines, together with the doublings, must be decided upon.

On carded yarn from 20s to 50s general practice usually requires that we use three processes of drawing and

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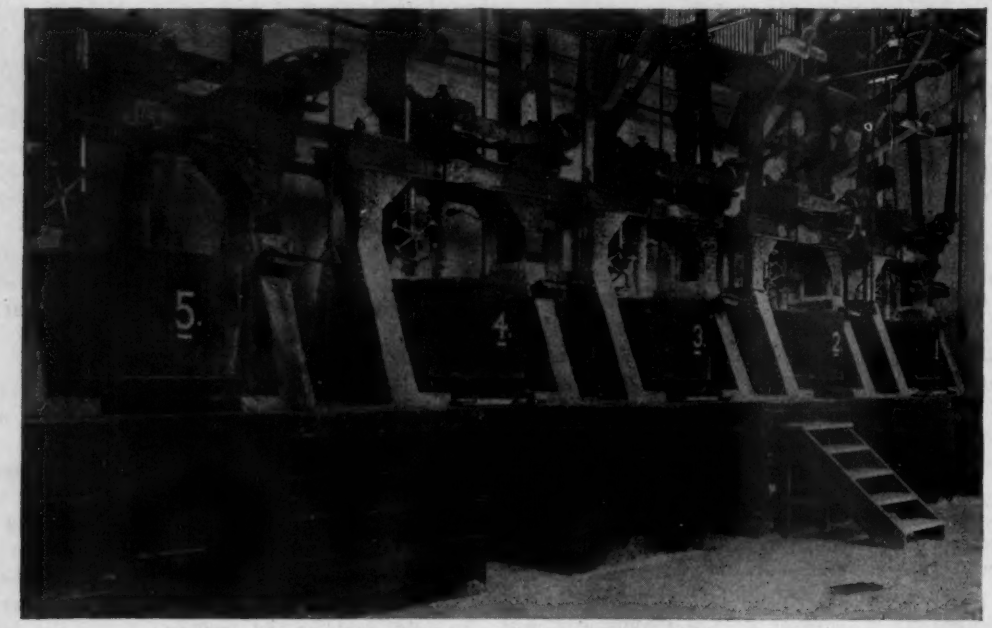

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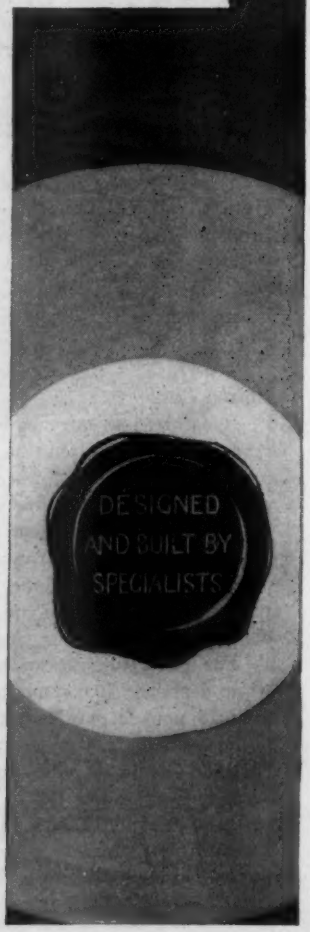

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three processes of roving.

It is necessary to consider the amount of waste removed at the various processes when calculating the drafts and doublings to give the required weights.

In order to have some basis, or foundation for lay-out calculations, we must have a range of drafts in order to arrive at a fair trial draft. The following drafts may be accepted as a good conservative range:

Opener picker	1.5 to 2
Intermediate picker	3 to 5
Finisher picker	3 to 5
Cards	80 to 120
Drawing frames, 6 ends up	5 to 7
Drawing frames, 8 ends up	6 to 8
Slubber	3 to 5
Intermediate	4 to 6
Roving	5 to 7
Jack	6 to 8
Ring frame, single roving	7 to 9
Ring frame, double roving	8 to 10

When considering drafts, we should be guided to some extent by the weight of the stock to be drawn. When working on finer numbers, longer drafts are allowable than would be in a case where heavy slivers and roving were used. Heavy sliver produces too much friction on the rolls when long drafts are used; consequently an uneven sliver is the result.

Common practice on drawing frames is to use a draft of six. Many successful carders believe that a slight variation in the drafts on drawing frames is beneficial to the stock. For instance, when using three processes of drawing, they would divide their drawing frame drafts as follows: First drawing, 5.7; second drawing, 6.0; third drawing, 6.3.

Single roving is not used in the United States to a very great extent except on special yarns where the finished product is not of a particular nature.

English mills, on the other hand, will spin as high as 60s from single roving very successfully. It is my firm belief that if doubling and drafting was more carefully considered, single roving at spinning could be used much more successfully than it is at the present time.

To illustrate clearly, how a complete layout is arrived at, we will take the following example:

What weights, drafts and doublings will be required to produce a 30s carded yarn using a 12 ounce lap on the back of the card, 6 per cent waste being allowed; three processes of drawing used, with 6 ends up at each process; and three processes of roving, doubling two ends on the intermediate, two on the roving and two on the spinning.

We must first reduce the weight of the lap to grains per yard. As there are 7000 grains in one pound, we get the following formula:

$$\frac{\text{Grains per pound} + \text{Ounces per yard of lap}}{\text{Ounces per pound.}} = \text{Weight of lap per yard in grains.}$$

Thus:— $\frac{7000 + 12}{16} = 5250$ grains per yard of lap.

A somewhat shorter method is to multiply the number of grains to the ounce, by the weight of one yard of lap in ounces. Thus:

$437.5 + 12 = 5250$ grains per yard of lap.

The next step will be to reduce the grains per yard of lap to the equivalent in hanks. To do this we divide the

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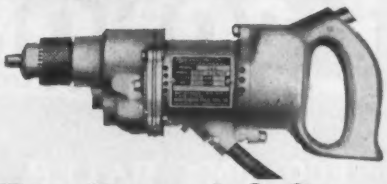

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grains per yard of lap into the constant 8.333, (8.333 is the weight in grains of one yard of No. 1s yarn, and is found by dividing the number of grains to the pound, by 840, there being 840 yards of No. 1s counts in one pound.)

$7000 \div 840 = 8.333$ grains per yard of No. 1s counts.

$8.333 \div 5250 = .00158$ hank lap.

We are now ready to find the total draft required from the card to spinning inclusive to make a 30s carded yarn from a .00158 hank lap at the card, with an allowance of six per cent for waste, and doubling six ends on three processes of drawing, doubling two ends on the intermediate, roving and spinning frames; no allowance being made for contraction due to twist at spinning.

Rule:—Multiply the counts required at spinning, by the doublings, less the per cent of waste allowed at the card and divide by the hank lap fed in at the back of the card. It will be noted in these calculations that no account is taken of the picker waste, as we start by using a 12 ounce lap delivered by the finisher picker.

$$\frac{30 \times 6 \times 6 \times 6 \times 2 \times 2 \times 2 \times .94}{.00158} = 30{,}841{,}519$$

total draft required.

To bring out this method as clearly and simply as possible I wish to mention that the results are arrived at in just the same manner as we would proceed to get the draft required in just one machine. For example, if we wish to spin 30s yarn from a 5 hank double roving, we would calculate the draft required by multiplying the counts required by the doublings and divide by the hank fed in. No percentage will of course have to be deducted for waste.

$$\frac{30 \times 2}{5} = 12 \text{ draft required.}$$

Now the total draft of 30,841,519 must be divided between the cards, drawing frames, roving frames and spinning. To accomplish this we must construct a trial draft layout, by assuming a draft for each machine, bearing in mind to keep within the proper range of drafts so far as possible. These drafts are then multiplied together for a trial draft. The aim should be to get a trial draft as close to the actual draft required as possible.

The following are good drafts to start with for 30s yarn: Card, 100; drawing, 6; slubber, 4; intermediate, 5.5; roving, 7; and spinning, 10. : : : :

$100 \times 6 \times 6 \times 6 \times 4 \times 5.5 \times 7 \times 10 = 33{,}264{,}000.$

This trial draft shows that we are rather high. The difference is found by dividing the trial draft by the total draft.

$$\frac{33{,}264{,}000}{30{,}841{,}519} = 1.078 \text{ decrease required.}$$

In this case we will reduce the draft at the slubber. This is accomplished by dividing the trial slubber draft by 1.078, the decrease in draft required.

$4 \div 1.078 = 3.71$, actual draft to use at the slubber.

In some cases, the difference between the trial draft and the total draft will be found to be too great to warrant making all the change at one machine. In such a case a change would be made at one machine, and if the change happens to be an increase, it would be necessary to multiply the total increase required by the draft assumed in the third draft and divide this by the increased draft decided on. The result will be the increase that is still required on some other machine. Should the change required be a decrease, then multiply the total decrease required by the

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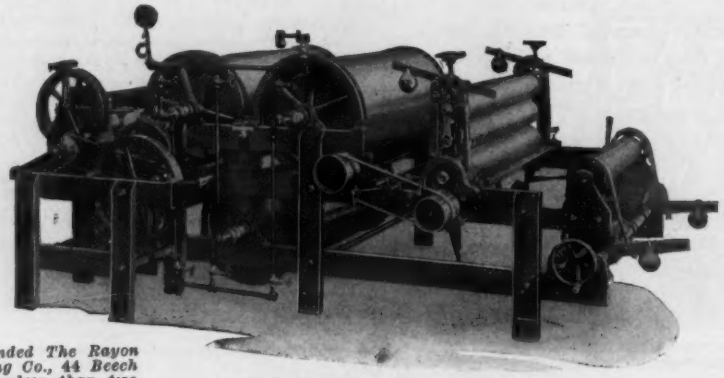

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change of draft decided upon, on one machine, and divide this result by the draft of that machine as used in the trial draft.

As an example, suppose the increase required is 1.31. As the trial draft used on the slubber was 4, and we wish to increase this 4.75, we can do so, and place the remaining increase required on the card.

$$\frac{1.31 \times 4}{4.75} = 1.1031 \text{ increase still required.}$$

$1.1031 \times 100 = 110.31$ draft to use on the card.

As an example where a decrease is required on more than one machine: Decrease required = 1.25. The trial draft used on the slubber was 4 and we wish to decrease this to 3.50. We can then place the balance of the decrease required on the intermediate, where a trial draft of 5.5 was assumed.

$$\frac{1.25 \times 3.5}{4} = 1.094 \text{ decrease still required.}$$

$$\frac{5.5}{1.094} = 5.027 \text{ draft to be used on the intermediate.}$$

After having found the correct drafts to use at each process, we can now ascertain just what weights or hank will be produced at each machine. To do this we commence at the card and work up to the spinning frame.

The first step will be to reduce the weight of the lap at back of card from ounces to grains.

$$\frac{7000 \times 12}{16} = 5250 \text{ grains per yard.}$$

To find the weight per yard of the card sliver divide the grains per yard of the lap less the per cent of waste taken out by the draft.

$$\frac{5250 \times .94}{100} = 49.350050 \text{ grains per yard of card sliver.}$$

Next we find the weight of the drawing sliver by multiplying the grains per yard of the card sliver by the doublings and divide this by the draft used. As we are using a draft of six on each process of drawing, the results will all be the same.

$$\frac{50 \times 6}{6} = 50 \text{ grains at 1st, 2nd and 3rd drawings.}$$

The balance of the calculations will be figured in hanks in preference to grains.

To reduce the weight of the drawing sliver from grains per yard to hank sliver we divide the grain sliver into the standard constant 8.333. The origin of this constant has been previously explained.

$8.333 \div 50 = .167$ hank sliver from the drawing.

The hank to be made on the slubber spindle is found by multiplying the hank sliver by the draft used on the slubber.

$.167 \times 3.71 = .61957$ hank on the slubber spindle.

The hank to be made on the intermediate spindle is found by multiplying the hank made on the slubber spindle by the draft used on the intermediate and dividing this result by the doublings used on the intermediate.

$$\frac{.61957 \times 5.5}{2} = 1.7038 \text{ hank on the intermediate spindle.}$$

To find the hank made on the roving frame spindle proceed as in the case of the intermediate.

$$\frac{1.7038 \times 7}{2} = 5.9633 \text{ hank on the roving frame spindle.}$$

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$$\frac{5.9633 \times 10}{2} = 29.816 \text{ counts from the spinning spindle.}$$

The foregoing layout of weights and drafts could also be used to produce a 35s yarn. The following calculation gives us the necessary change required for the draft at spinning.

$$\frac{35 \times 2}{5.96} = 11.74 \text{ draft required at the spinning.}$$

Although there are several other methods for arriving at the same conclusion, I believe the method described is the simplest and most easily understood. Though of a somewhat lengthy nature, insofar as the explanations necessary to proper clarity is concerned, I believe that it will be found quite easy after a little study.

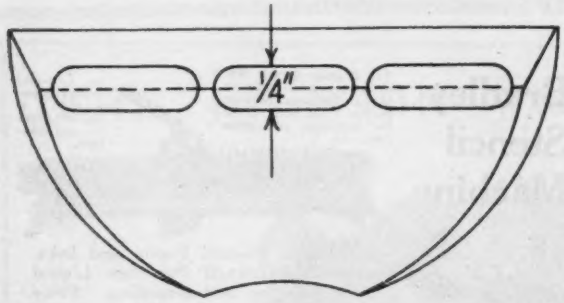
C. C. (MASS.)

A Comber Sliver Pan Kink.

EDITOR COTTON:

The sliver pan on the Nasmith combers are all plain, without any slots for the leaf, sand, etc., to drop through and this is often carried forward in the sliver in its passages over the sliver pan.

Any men who have this type of comber must have noticed how the leaf, sand, and small fly collect at the bottom of the bent part of the tin which is a convenient place for it to gather. To keep the tin from accumulating this dirt, it must be highly polished at least once a week, for tin



work soon becomes dull and rough, and more so at the point mentioned, for the combed sliver does not touch this place.

To overcome this evil I had three slots cut 3/16-inch wide at the bottom of the bend in the tin, and when the slot was cut it took 3/32 inch from the bottom of the bent part and 3/32 inch from the bottom of the tin, leaving a space of 3/16 inch between the slots and 1/8 inch at the two extreme ends so the tin will have no weakness. The dotted line will show the instep of the tin previous to cutting the slots, and also will show how 3/32 inch is cut off the bent and flat parts of the tin.

It must have been at least two years since I had all the tins done this way on our combers, and I have never had any trouble with them since, either with the tin or the evil of the undesirable dirt collecting at that point. Some may suggest having quarter-inch holes bored in place of the slots, but they will find that the dirt will accumulate just the same.

I trust this will prove of some help and interest to readers who have Nasmith combers. JOCK (MASS.)

Quill Breakage on Looms.

EDITOR COTTON:

I note the question on quill breakage from the man who says he has a breakage of 75 to 100 quills a day on 160 looms. Under the conditions he outlines, I should not call this so very bad. The shuttle feeler motion on the battery could be improved to keep it from breaking the quills on the transfer of the quills. That is, the feeler motion does not detect the shuttle when it is out of position. I would suggest that he run a good check on his battery end so the shuttle will always be in position when the transfer takes place, running the shuttle feeler with as little tension as possible and making certain not to run the latch any higher than the transfer or lay bunter calls for.

P. T. S. (MAINE).

EDITOR COTTON:

The question of quill breakage was brought up by "Contributor No. 2017" in the June issue of COTTON. He said on 160 Hopedale automatic looms, with a lay four inches shorter than standard, on a three up one down common twill weave, his breakage varies from 75 to 100 quills per day. He said his looms, which are four years old, make 150 picks a minute, and that the average number of the yarns is 5s.

I think this gentleman's quill breakage is very high. I have looked into my own quill breakage record carefully, and I find that we have an average of 23 quills broken per day and night run (22 hours) on 388 40-inch high speed Hopedale looms, on a 39-inch 80x80, 4.00-yard construction, with a loom speed of 185 picks per minute.

This man asked for some suggestions as to reducing this breakage. Some of the causes of quills being broken are: not having the picker stick set snugly to the lay, and not setting the guide as far to the end of the lay as it can be set so that the bobbin will have freedom in falling out of the lay to the can.

Bad pickers will cause bobbins to get broken by the shuttles not being in alignment with the transferer, and as the bobbin is transferred from the battery to the shuttle, the rings on the bobbin will not catch correctly in the spring in the shuttle. When a picker gets worn so that the shuttle will travel ⅛ inch or ¼ inch farther in the lay, the bobbin will not catch with the three or even two rings in the shuttle spring.

The transferers not being set up right will cause the loom to break bobbins. A loom out of repair from the foregoing causes will sometimes cause one loom alone to break two to three dozen bobbins per day. Most all loom fixers are or should be very familiar with the proper settings of the transferer to the shuttle.

We have to discard a great many of our quills on account of their becoming worn off on the small end until they become too short to lie in the battery, and sometimes where a quill gets worn too short until it will not fall out of the battery, will not lie straight in the battery, and when the transferer goes to change the bobbin from the battery to the shuttle, the bobbin will not go in straight, thereby causing the bobbin to get broken.

We are overcoming the wear on the small end of the quill by using a ½-inch brass tip on the end of the bobbins, which will certainly help to eliminate the breakage on the bobbins. CONTRIBUTOR NO. 716.

Knitting Section

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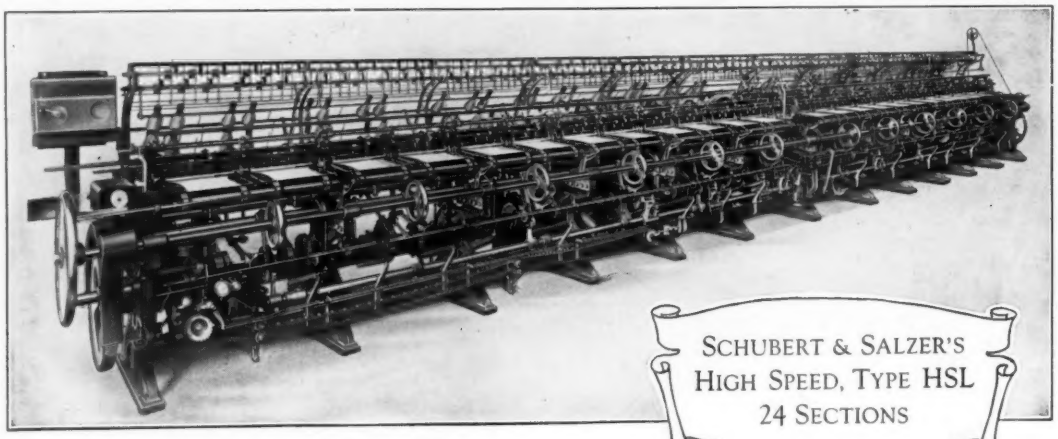

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Trade Marks—Identification—Good-will*

BY F. X. HESS.†

Trade marks are far older than any laws concerning them. Trade marks are as old as commerce itself; in fact, no organized system of trade could be carried on without the aid of symbols of origin and ownership.

Trade marks serve many purposes; for the manufacturer, there is their advertising value; they act as an incentive for him to uphold the quality of his product, and as an ideal to hold before himself. Any deterioration in the quality of the product would result in negativing the reputation previously built up, and you can readily see the wisdom of maintaining the quality at all times. Trade marks help to control and reduce costs of distribution, by making the sale as nearly automatic as possible. Trade marks create good-will for the product. A very good definition of good-will is one recently given by a judge in one of our federal courts: "Good-will is the disposition of a customer to return to the merchant for another purchase."

For the customer, the trade mark or name serves as the identification of the maker of the merchandise, and this, I believe, is the most important single function of the trade mark. Likewise, it also serves as the guaranty of the manufacturer to the consumer. With trademarked merchandise the retailer always knows that, in the event of claims for imperfections or shortages, he can always go back to the manufacturer for redress.

Whole advertising campaigns are based on trade names or trade marks. You can always spend all the money you wish, in advertising; however, do not lose sight of the fact that the benefits of advertising are cumulative, provided the merchandise has real merit, and for a long pull, provided good judgment has been exercised, the money spent for advertising and publicity will come back to you in increased volume of orders.

Federal registration of a trade mark is prima facie, or documentary evidence of ownership and title, and in any suit for infringement, it is not necessary to submit any other evidence of priority of origin and use. However, even though an owner should neglect to register, he may still recover under the common law if he can prove beyond doubt that he has priority of adoption and use in interstate commerce.

Registration of trade marks in the United States is necessary as a basis for registration in foreign countries. One measure of protection of a registered trade mark, about which not so much is heard, is that any foreign merchandise wrongfully bearing a domestic registered trade mark, may be barred from entering this country. This is one of the numerous ramifications of the Treasury Department working through the customs.

With all the protection that has been thrown around trade marks it is a curious thing that the importance of trade marking is still not fully realized. Numerous cases can be cited of the neglect of the owners of perfectly good names and marks to properly protect their rights. It must not be inferred that infringements are intentional but rather the result of our highly commercialized system of intercourse. It is my opinion that in the recent litigation involving the trade mark "Normandy Voile," the rightful owner of the trade mark lost the decision simply because he had not done everything that he possibly could to safeguard his property. There was a perfectly good trade name. In fact, I think it was much better than the average coined name used in the textile industry; nevertheless, simply because the owners did not fully realize the necessity of full protection, defendant obtained the decision.

In estimating the importance of trade marks and trade names of meritorious products, I think it would be difficult to over-emphasize their value. A good name should always be worked for all that it is worth. There is not much nourishment in working up a high grade article and then selling it without your name on it. In so doing you play into the hands of the market which you no doubt do not control and you lose the benefits of your labors. An illustration of the value of the name may be cited in the Bissell Carpet Sweeper; some years ago the president of this concern made the remark that there were plenty of other carpet sweepers on the market, same type as his; he actually stated that he knew that some sweepers were better than the Bissell, but simply because these other manufacturers had not played the merchandising game to the limit, the Bissell had survived, and the others had practically all disappeared.

A merchant in Athens, Greece, with whom I am personally acquainted, once told me that a consignment of leather reached him; the shipment was made up of two grades, A and B. By accident, the tanner's trade mark had been left off of the Grade A and he had hard work to dispose of it; he said it would have been cheaper to return it to America, than to sell it at the sacrifice price.

Several years ago it was said that the name Uneeda Biscuit was worth $13,000,000; just the name, mind you, without any tangible assets. I guess it is worth much more today.

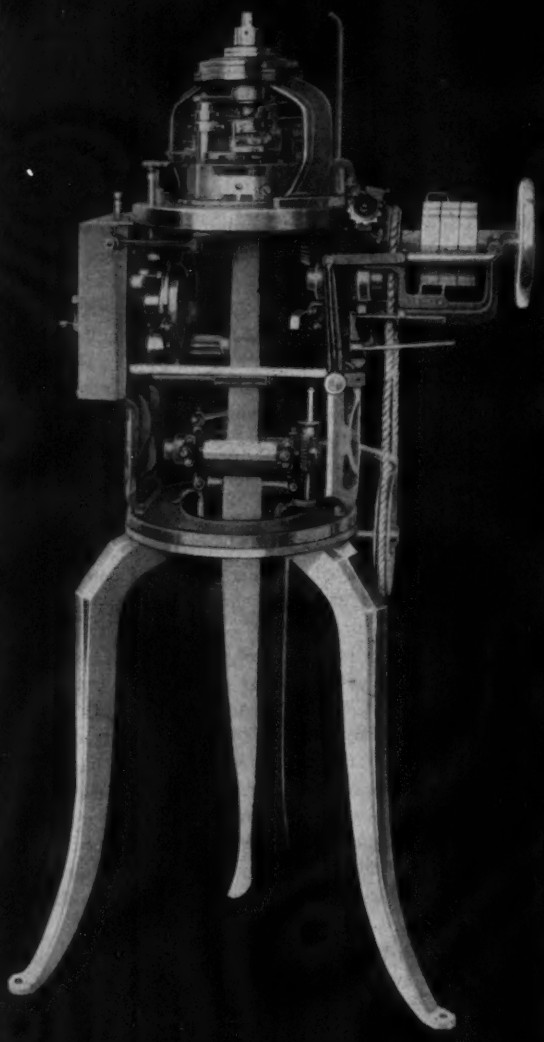
Two years ago the Dodge Brothers automobile business was sold to a syndicate for $146,000,000. Of this sum, $79,000,000 alone, was for good-will, and the remaining $67,000,000 was paid for cash on hand, inventory, plant, bills receivable, and what not. Truly a formidable sum, and it certainly should give you men, who are on the threshold of your business careers, something to think about as bearing a very good illustration of the tremendous values that can be accumulated in the way of customer good-will. I hope that you will not consider this as in any way an advertisement of the Dodge car, that is, on my part. It happens that I do not drive one. But it is a wonderful illustration of my subject.

Two very good illustrations of the value of trade marks and good will are the Wamsutta and Beacon lines. Let us suppose that there was no adequate protection for these names; try to picture the confusion that would result. The confusion resulting from the San Francisco earthquake and fire would be mild in comparison.

And as stated in my opening remarks, you certainly can appreciate that no organized and orderly system of commerce could exist for 24 hours, were it not for trade marks, and incidentally, adequate protection for them.

*Extracts from an address at the New Bedford Textile School.

†Manager of the Boston office of the Kaumagraph Company.



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Let quality and high business ideals be reflected in all your activities. The senior J. Pierpont Morgan once said that the basis for all lasting and enduring business is character and integrity. He said that he would lend a million dollars any day to a man of known character and integrity, without any security other than that man's signature on his note. On the other hand, a man unknown to him, asking for a loan, and presenting a million dollars in securities, could not get a cent from him.

It has been said that the plant owned by the makers of Ivory Soap could burn up over-night, uninsured, and at the end of one week, the value could be re-capitalized. That is to say the re-capitalization would be made on the basis of the good-will.

The A B C of Dyeing

BY NOEL D. WHITE.

PART TWO.

The first step in preparing silk hosiery for dyeing is a thorough boil-off. In this operation is decided the final outcome of the dyeing. When the silk is well degummed it is half dyed. Most of the trouble in uneven goods; harsh places, especially in the sole of the stocking and the top of the heel; streaks up and down the leg, etc., can be traced to an imperfect boil-off.

The boiling off of silk can be done with soap, or with a boil-off oil, of which there are a number on the market today. The goods should be handled in nets to protect the silk, also to facilitate in the handling and prevent the tangling that occurs in too big a bulk. The quality of soap used is of the utmost importance. Any treatise on the subject I have ever read advises the use of the best of olive oil soap for good results.

The silk is covered with a gum called sericin, which protects the fiber and is left on it while it is wound, doubled and twisted in the throwing plants where the silk is prepared for the different fabrics it is intended to be used for. For hosiery it is prepared in from three to twelve threads; or it is doubled or braided with from one to three strands of silk and some artificial silk, either Rayon, Tubize or Celanese. In either case, the silk must be boiled off thoroughly.

We will take first the pure silk hosiery. As stated above, olive oil soap is recommended as the best medium to remove the sericin. That is the best medium for skeins, ribbons, piece goods for linings and dress goods, also for mixtures of silk and cotton, or wool.

The goods enter the soap bath loose and open, and are assured of an even treatment right from the start. But it is a well known fact that with a bath made up with the right proportion of soap, which is from 20 per cent to 25 per cent of soap calculated on the weight of the silk, at the end of the operation the soap is well broken up. The same is true with hosiery, but as they are put up in net bags with from three to four dozen stockings to the bag, according to the weight of the goods, the stockings on the outside or near the bag get the full benefit of the soap as soon as the operation starts, and by the time the stockings in the center of the bag begin to get their quota of the degumming soap, the bath is quite broken up and unable to do its work properly. Consequently we get hard soles, where the gum is only partially removed, and uneven dyeing is the result. In this case the olive oil soap was found to be not the best for good results.

Of course the amount of soap could be increased and overcome that, but soap is a costly item and we look around for a satisfactory solution of the difficulty without increasing the cost. Thus we found that in our case a good grade of tallow soap was fully as good as the best olive oil soap, and would not break up so easily. With the aid of one per cent of soda ash free from caustic, the bath is made to keep its degumming strength until the end of the boiling off operation.

There is a tendency today to use, as I have mentioned, some sort of a boil-off oil. I have tried it. It does the work, but as for using it, I never found that it was better than tallow soap for silk alone. For silk and rayon, or any of the artificial silks, I must say it is much better and safer. For some reason I am not prepared to state, in boiling off with soap, silk hosiery mixed with rayon could not be washed thoroughly. Even with the softest water obtainable from a standard commercial system of filtering, some grease bullets the size of a pinhead would remain in the goods, defy the longest washing, and show up in the shape of oil spots on the finished product. Boiling off with oil prevented that, and never gave me any trouble.

After the goods are boiled off, a good washing is necessary, a whizzing in the extractor, and after a dressing or straightening out of tangles, the goods are put in the net bags in which they are to be dyed. Sometime ago it was suggested that the best results were to be obtained by dyeing right in the boil-off bath. It was argued for the new method that better and more level dyeing in a shorter time could be obtained than by dyeing in two baths. It was adopted by some dyers, and someone even prophesied that it would become general in the near future.

That was a few years ago. That there still are some who like that method I know, and I also know of some dyers who adopted the new method and discarded it for the two-bath way.

Silk is the brightest of all natural fibers, and is at its best when thoroughly clean. Souring with acetic, citric, tartaric, or formic acid in a warm water bath will bring out to the fullest this natural and valuable property of silk. Dyeing with Glauber's salt and a little acid has the same effect; the final rinse, either with or without acid, will leave the silk at its best with a beautiful feel which cannot be obtained otherwise.

Then in dyeing with a clean bath a formula can be arrived at for a given shade which will check up with very little variation, lot after lot, but the same cannot be said for dyeing in the boil-off bath. The saving of time, which is claimed to be the big feature of dyeing in the boil-off bath, thereby becomes problematical. A chance shot may be the result, but not the regular occurrence. Whereas in a clean bath, the time of dyeing a lot may be set down at one hour, or one and a half hours, and be reasonably sure about it; in the one bath dyeing one is never sure how long it is going to take to finish a lot.

As for level dyeing, hosiery can be dyed level in the two bath process as well as with the soap dyeing, providing the right chemicals are used and used at the proper

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time, and then the proper dyestuffs are used. With a suitable selection of dyestuffs, any shade can be obtained with from two to six colors. Never more than six should be necessary. If a higher number are required for a shade, some of the dyes are not the proper ones to use. I mean by that the selection is not right.

I was once dyeing a shade which I could not match exactly with less than eight colors. I looked over our collection of dyestuff tests, which I always keep for reference in a case like this, and to which I keep adding the tests of every new dye that comes to my attention. After a few trials in the laboratory, I found that I had a direct color that could be used in the place of four I had in our shade. Three direct colors and an acid color were eliminated, and only one put in their place. Of course this takes time, and patience; but it certainly pays when the dyer realizes that the fewer colors used in the combination the easier it is to keep in check and uniform. The amount of dyestuff used in the one bath method plays an important part, also, when compared with two baths as well as with the use of an organic acid to aid absorption in the dyeing bath.

A little example will bring forcibly to the attention of the reader the difference in the two methods. As I stated above, I used to boil off silk mixed with rayon with boil-off oil, and I decided to dye in the same bath. A sample was selected for the first trial. I used the same amount of direct colors for the cotton, and the rayon; for the silk I deemed it necessary to increase the amount of neutral color necessary to shade it. We were using in our regular way 25 grams of it, we put in 50 grams (nearly two ounces). It was not nearly enough. Twice that amount was still not enough, and at the end of the dyeing when we had a match satisfactory, we found that five times the usual amount had been used for this shade. Subsequent dyeings of the same shade on the same material, and in the same way proved to us that we needed all of that, more or less, to obtain satisfactory results.

However, if any dyer who is not acquainted with silk dyeing should be tempted to try out my method, he should first make himself familiar with the working property of his dyestuffs when used with acetic acid in the bath. Many otherwise good colors are not suited for this use and go on uneven as soon as the acid is entered. Many substantive or direct colors which are supposed to leave cotton white, will dye the silk when acid is used, and so little color is required to dye silk when acid is used that the dyer is liable to get into trouble unless he has first learned in the laboratory how to go about it. But when a proper selection of suitable dyes is at hand, and their behavior is mastered, the work becomes a pleasure, and the economy will be found to be no small item, to say nothing of the quality of work obtained. The dye bath is constantly under control, and it will be found at the end of the operation to be thoroughly exhausted even with the darkest shade.

In my next article the question of how to match a sample in the laboratory, and how to adapt the formula in the dyehouse will be discussed.

The following changes in branch office locations has been announced by the Armstrong Cork and Insulation Company: The New York Office of this company is now located at 225 Broadway, New York City; the Tulsa Office is now located at 419 Central National Bank Building, Tulsa, Okla.

Female Full-Fashioned Knitters.

The practicability of having women operate full-fashioned hosiery machines is being discussed in a quiet way among a few manufacturers, who say they believe the end of the day when male knitters dominate in that field is not far distant. In fact, it is stated, women are being so employed experimentally in at least two mills, with what result has not been divulged. One mill executive is authority for the statement that there is in prospect an improvement whereby at least one of the mechanical operations of full-fashioned machines will be so simplified that it can be performed by women as readily as by men. This refers to the turn-over, intended to be effected by means of an electric attachment which would necessitate simply the pressing of a button.

"We believe it is coming," said an executive of one of the better known mills, "and have no doubt it would be perfectly feasible. If this can be brought about, we see no reason why women should not operate full-fashioned machines as satisfactorily and with no more strain than in taking care of a battery of seamless machines. In fact, I feel that women would yield readily to training and that in the handling of silk and putting it into fine hosiery they might fill the bill better than the average male knitter."

Speaking of the electrically controlled turnover, an executive of another large full-fashioned organization says he has no doubt it will be perfected within a year or two. It is practical and already is in use in a small way, as yet in somewhat crude form, it was stated. "For the present," he continued, "we insist upon hand turn-over, but when that operation can be performed as satisfactorily by a mechanical attachment as by hand, we probably would adopt it."

It is held by some that women skilled in circular knitting, a division in which employment is diminishing, would be desirable as full fashioned knitters in the event the proposed improvement, for lessening the physical strain, becomes a reality. It is pointed out that women, in large extent, superseded men in the boarding room after the introduction of the modern metal steam or electrically heated hosiery forms. It was the adoption of the metal forms, which now have almost wholly displaced the wooden forms, that brought relief to manufacturers from unionized boarder domination, and, said a manufacturer, "we look for the same measure of relief in the full-fashioned knitting room so soon as it has been demonstrated that women can take the places of men in the operation of knitting machines. Personally, I would be in favor of paying the same wage scale for both male and female knitters, but we would adhere to our present policy of maintaining an absolutely open shop."

Four New National Colors.

National Aniline & Chemical Company, 40 Rector St., New York City, announce the addition of four colors to their various lines: National Erie Yellow S 2 G Conc., slightly greener and brighter in shade than Erie Yellow F; National Alizarol Brown E B, a new wool dye; National Alphazurine B Conc., an acid blue particularly for wool and silk; and National Sulphur Orange G Conc., for cotton yarn and piece-goods.

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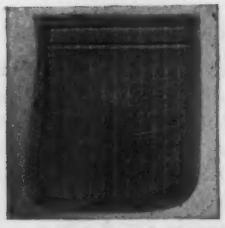

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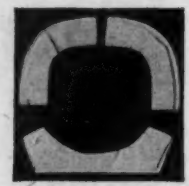


Yokes for Athletic Underwear

Sweater Pocket

Multi-Cross-Dyeing on Silk Hosiery

BY "DYEHOUSER."

In a previous article, published in March, 1927, COTTON, I gave a brief outline of the various working methods for three-fiber hose. These concerned the most economical and easiest methods in the dyehouse in preparation for dyeing unions on these goods. One must specify when he is mentioning hose now-a-days, with the various styles containing multi-fibered yarns, whether it is a union or the many types of multi-cross-dyeing that are now a necessity to mills.

In union dyeing there is usually used, on these multi-fiber hose, a preliminary boil-off bath, so that the temperature is sufficient in the one bath to rid the hose of streaks and spots from the knitting oils used. But in the many phases of cross-dyeing and multi-cross-dyeing, there is a very low temperature used as the ingrain colored fibers are not dyed with fast enough colors to use a high temperature; this low temperature necessitates the use of various penetrating and leveling agents. These agents naturally do not remove the knitting oils and so the result is that there are many oil spots on this type of dyeing. Preliminary to the dyeing operations on the multi-cross-dyeing, a good hot wash at 150 to 170 degrees F. with a neutral olive oil soap or two per cent sulphonated castor oil with neutral olive oil and ½ per cent of some mild alkali like silicate of soda or tri-sodium-phosphate, giving the goods 10 to 15 minutes in this bath, will remove most of the knitting oil from the hosiery to be cross-dyed. To help prevent the ingrain dyed fiber from washing out or fading, add 10 to 20 per cent common salt to the bath; this should "set" the colors sufficiently for the regular dyebath.

The preparation of silk hosiery ready for the dyebath leads to the time old controversy concerning the points of merit of the one- and two-bath methods of dyeing silk hose. In this article, the procedure will be discussed only as each method has its merits and is applicable according to the especial adaptability of the dyehouse equipment and the necessary production required of the dyehouse superintendent.

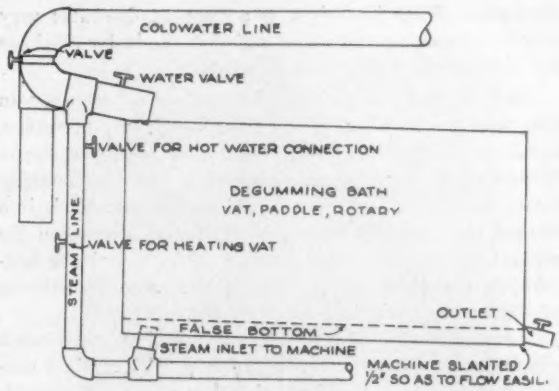
Some mills prefer to buy the cheapest of oils. This has proven poor economy many a time, especially in the buying of silk boil-off oils that have been "loaded" with alkalis. It is usually best to let the dyer fix the special percentage of mild alkalis which he sees fit to add to the silk degumming bath. Oils that have been loaded with alkalis will sometimes solidify out and give uneven results in the degumming operation.

The ideal degumming bath is the use of two neutral olive soap baths, but this takes up too much time, so a liquid soap known in the trade as "boil-off" silk oil is usually used. According to the softness of the water supply, if the water is of zero hardness, then, the use of the oil can be regulated to a certainty. For the smaller styles of silk hosiery and half-hose, a vat can be used sometimes, if the false bottom is so arranged as to give sufficient circulation of the degumming operation to be thorough. If the steam pipes under the false bottom are so set at the proper angles they can aid materially in the circulation. This type of degumming vat lessens the wear on the silk because there is no agitation other than the liquor circulating.

With the usual better grades of degumming oil, using around 10 to 15 per cent on the two-bath method gives a thoroughly degummed silk. The cost can be lowered by using 30 to 50 per cent less oil and 2 or 3 per cent of some mild alkali like silicate of soda, tri-sodium-phosphate or modified soda ash. Have these alkalies thoroughly boiled up into solution and then strain into the degumming bath before entering the goods to be degummed. This second formula usually cuts the period of degumming 15 or 30 minutes, but the circulation and temperature must be well regulated or there will be uneven degumming of the silk. This may cause the silk to have a harsh feel, especially if the vat is packed too tightly.

After one hour of boiling at 200 degrees F., flush the bath with hot water, then give two or three hot washes, but do not bring up with steam for this has a tendency to stiffen the silk and it may streak or spot on dyeing from this cause.

Another formula that has given good results and is quite economical is 3 to 4 per cent boil-off oil, 3 to 4 per



cent neutral oilve soap (boiled up and strained) and 1 per cent of some mild alkali, as mentioned. The degumming method is the same as that described.

For paddle machines these formulae usually have to be increased 10 or 25 per cent to do their work quickly and prevent too much wear and tear on the silk. The use of a larger percentage for the paddle type of machine is caused by the longer bath or greater volume of water per pound of hosiery to be degummed.

Now for the rotary or closed package type of hosiery dyeing machine, the bath is much shorter and so the dyer usually cuts the percentage of degumming oils 20 per cent and secures satisfactory results. On either the paddle or rotary the degumming operation should be made as short as possible without making it too strenuous for the silk.

In the washing of the hosiery after it is properly degummed, if hot water is not available, have a special connection made on the cold water line from the steam line, as shown in sketch, so as to throw the steam into the cold water line. These two can be opened at the same time, thereby giving a hot water stream on the degummed hosiery without adding the cold water and then raising the water to a sufficient temperature. This is one of the main causes of sericin or silk gum spots being left in hosiery that has

been degummed, by the gum being thrown back on the silk. When the cold water hits the silk, raising the bath by steam adds a further chance of "harshening" the feel of the hosiery and makes the time necessary for proper degumming and washing too long and uneconomical in the quality of the goods produced, for it will necessitate a further use of softening oils in the dyebath to bring the feel of the silk back to a satisfactory condition. This harsh condition on the silk is caused mainly by the rapid changes in the temperature in the degumming bath, but if silk hosiery can be put in the extractor in a warm condition and extracted, and then "shaken" or untangled immediately, it will help remedy this trouble.

Having the hose in a satisfactory condition ready for the dyebath with the least amount of handling and time spent on them, is the point to attain to get quality production.

For the dyebath, a small addition of the very best grade of sulphonated castor oil will aid in keeping the silk in good condition and help to level the shade, as well as give penetration on the heels and toes. The addition of various penetration agents should be kept as small as possible for some of these preparations have a tendency to mottle or dull the shade on storage. Instead of adding these preparations it will be more satisfactory and economical to match the shades up again with some fast to light and washing dyestuffs. What is desired is a type of dyestuffs very slow in exhausting and which will give the luster of shade and levelness in dyeing that is wanted.

The one-bath method has its feature of economy in time and the number of handling operations necessary, but it also has the uncertainties of two counteracting forces in the dyebath, for while the degumming operation is taking place, the dyestuff is being forced on the silk. This is a method that must be controlled to the *n*th degree on the amount of degumming oil, volume of bath, and the temperature should be controlled carefully. Also the softness of the water supply is a major factor.

Some dyehouse men prefer union dyeing colors while others prefer silk white direct dyestuffs with straight neutral colors in the combination. There are certain mills that secure excellent results by using Glauber's salt, adding this to the dyebath, but there are certain neutral dyeing colors that are very difficult to force on the silk in the one-bath method. So naturally, the dyer goes back to the old silk dyeing method of dyeing in a "cracked" bath by adding acetic acid to the bath after the Glauber's salt has driven the color sufficiently on the cotton for the desired shade.

The great differences in the dyeing properties of the neutral colors, under conditions existing in the one-bath method, naturally lead to numerous additions of dyestuffs and changes in formula. This evil is met in a much lesser degree in the two-bath method, where a well established mill formula will run almost as satisfactorily as a dyeing formula on cotton. Where a mill has a certain number of dozen of hosiery to be dyed on each capacity machine, then the dyehouse superintendent can work out formulae to suit each machine and amount of goods. But he cannot take the one-bath dyeing formula over to another machine and work it satisfactorily without some changes in it, and naturally a longer time in the bath. The two-bath method usually can be taken on a straight percentage formula and run from a small to large capacity machine and checked fairly closely. Each method has its weaknesses and both can be improved greatly. The sericin in the one-bath, while acting as a good dyeing medium, also has to be washed out thoroughly and it will dull a shade considerably to give it a hot wash, though for lighter weight hosiery there is a very good feel given the hose by this method compared to the flimsiness caused by the two-bath method which calls for a special finish to be put on this type of hose.

To counteract this "silky flimsiness" that silk hosiery sometimes has in using the two-bath method, add ½ per cent sulphonated castor oil and ½ per cent sulphonated olive oil to the dyebath. Run the hosiery to be dyed in this bath for a few minutes, especially if the goods have been degummed and kept in storage before the color is added.

The addition of the salt in two parts is always advisable.

This addition of softening oils to the regular dyebath gives the "feel" that is desired on the hose, and while it increases the percentage of silk dyestuff to be used, it also slows up the rate of exhaustion and aids to give a better penetration in the silk dyeing.

The selection of neutral dyeing silk colors should be made because of their ability to combine in the popular mode shades, rate of exhaustion, and penetration of the silk fiber. There are a great many colors on the market that are too rapid in exhaustion and, naturally, the silk is only dyed on the surface. This trouble can be caught and remedied by purchasing a small magnifying glass and examining the silk hose on the next lot turned by for redyes. Under the glass you will find the silk has a "flaky" appearance caused by too rapid exhaustion and uneven dyeing of the silk color.

To soften the hose after dyeing a similar addition of softening oils as recommended for the regular dyebath can be made at 100 degrees F. and run 10 minutes which will aid the goods in feeling and appearance.

An Interesting Booklet.

Union Drawn Steel Company, of Beaver Falls, Pa., is issuing a series of twelve bulletins portraying the application of Union Drawn steel bars to various uses, and No. 5 of the series is an attractive brochure devoted to "Textiles." The cover is striking, depicting the sources of the four textile fibers, wool, cotton, linen and silk. An inside page gives an interesting, yet brief, outline of the early history of textile manufacture, from prehistoric into Biblical times. The use of Union Drawn steel in a full-fashioned hosiery machine is illustrated as an instance of application, emphasizing the needle bar clamp.

Neutrasol Southern Representatives.

John M. Barr & Co., Whitin Building, Charlotte, N. C., have secured the appointment as southern representatives for the Neutrasol Products Corp., 41 Park Row, New York City, manufacturers of textile oils and sizings, including Neutrasol V-75 for soaking natural silk and Neutrayon for lubricating artificial silk or rayon.

Opens Chicago Office.

The Falk Corporation of Milwaukee, Wisconsin, manufacturers of herringbone gears, speed reducers, steel castings, etc., have opened an office in Chicago at 122 South Michigan Avenue.

Warp Loom Designs

By WILLIAM DAVIS, M. A.

The warp loom fabric is taking an important place in our textile requirements and it will be of interest to give some attention to styles of pattern which are being found most suitable for present day requirements. It would be difficult indeed to trace all the ramifications of this interesting semi-woven and semi-knitted texture. It has been largely used in recent months for scarves which are worn by men of fashion. These are usually worked in artificial silk in broad stripes of strongly contrasting colorings in which we have generally white as a stripe about 1½ inches

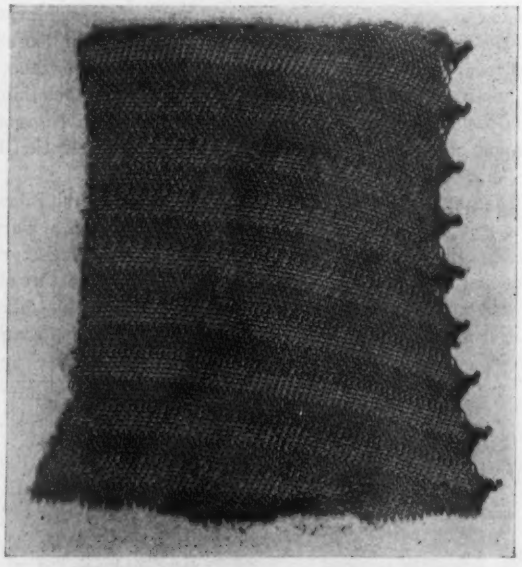


Fig. 1. Showing the Indented Edge at the Right Caused by the Added Needles.

in width while the second and darker element of the stripe is composed of several bright colors. The white harmonizes with the general scheme of evening dress in black and white while the colors give a suitable variation on the color scheme. In these scarves the lap of the guide bars is of the plainest, there is certainly no suggestion of having anything in the nature of a vandyke style where the pattern would break up the dark and colored stripes by making them mingle their colors at the edge. The ordinary one and one lap, one to the right and back again to the left alternately is employed as being the simplest possible for it gives little mingling of the colors at the join of the stripe and gives a clear junction of the colors.

After the plainest type of lap we have what are known as vandyke patterns where the lap of the guide bar extends over a greater width. The characteristic test of this style of pattern is the zig-zag nature of the selvage caused by having the guide bar lapping persistently towards the right for several courses, and when the pattern is retraced as the guide bar reverses its action and needle by needle travels back to the starting point. Fig. 1 gives a view of a warp loom pattern where the ground color is solid lavender or grey and the guide bar laps persistently towards the right for eight courses of loops, after which it returns needle by needle at each course until it arrives back at its first needle again. By this motion it follows that when the guide bar is moving towards the right it is emptying a needle on the left at each course which means that an indent is being made there. At the right side however the guide takes in a needle further to the right at each course which gives a projection from the straight edge. The salvage is shown on the right of Fig. 1, where the peaks are produced by the traveling guide bar.

Now it is clear that this kind of selvage is a disadvantage for many types of articles, particularly when the sidewise motion is of larger extent than that just mentioned when the peaks will be much more pronounced. In making up the fabric these peaks have usually to be cut off right along the selvage which creates waste; in other cases several threads are placed on each side of the frame on separate rollers and these have a straight action so that the edge is made to look more uniform. Even here however the edge tends to appear unsightly and the whole edge is often cut off before the fabric is carved into articles of apparel. Of course in many types of scarves, for example, these vandyke edges, in certain seasons, take a definite place as variants of fashion and they are made up as

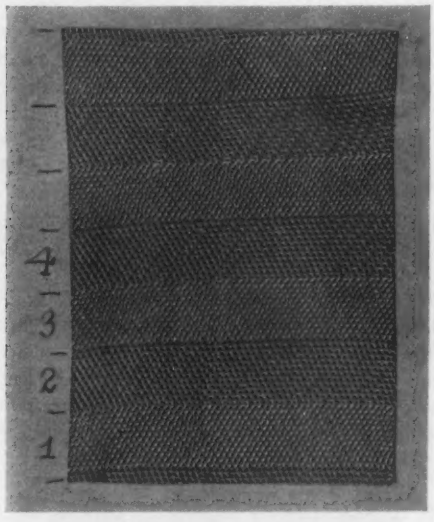


Fig. 2. Showing Difference in Stripes Caused by a Reversal of Motion after 12 Needle Spaces.

they are, but in such cases the lap is usually made much more pronounced so as to afford larger indentures on each edge.

Figure 2 is interesting as showing a type of pattern which has figured with extraordinary persistency in the textile demands of the present season. It is worked on a single bar warp loom where the warp is composed of white artificial silk and the guide bar is given a persistent movement towards the right at each course for 12 needle spaces followed by a reversal of the motion when the guide bar returns to the start after 11 courses. The stripes are shown crosswise and the leftward moving sections are given as the odd numbers namely, 1, 3, etc., while the sections which have a movement towards the right are given the even numbers 2, 4, etc. Now this herringbone arrangement of

pattern in a solid white ground would have little effect except for the very attractive play of light on the left part of the bone as compared with the right portion and it is this difference in the reflection of light from the two constituents of the stripe that forms the basis of the success of the fabric. This cloth has been extensively used for the trade in knickers, blouses and outer dresses for ladies. Where possible the fabric is turned round a right angle so that the effect appears in the vertical direction which is smarter in appearance than the cross effect. For outer garments, however, the fabric is varied in that the majority of the article is made with the stripe showing vertically

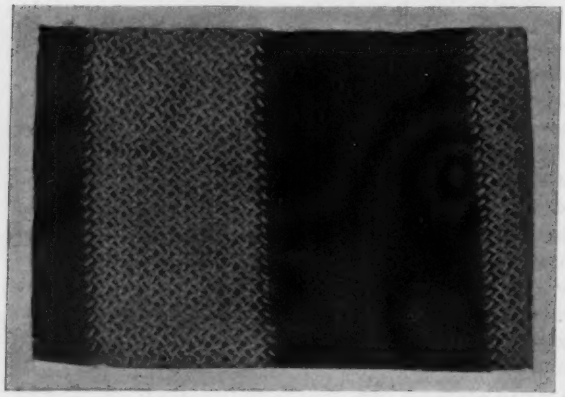


Fig. 3. A Pattern in Vertcial Stripe Effect.

but in parts such as the waist, cuffs, etc., the fabric is turned at right angles to trim and this gives an attractive variation on the prevailing vertical style of pattern.

The illustration at Fig. 3 gives a view of a vertical stripe worked on a latch needle warp loom where the two ground colors are fawn and dark brown tempered with a vertical fancy stripe at the edge of the brown where it joins the light colors. All the guide points in the machine are filled, there is a thread for each needle and the order in which the threads are placed in the guides is as follows: 2 red fancy, 11 light fawn, 13 dark brown. The lap is the simplest possible, being one needle to the right and one needle back again to the left alternately. It will be noticed that where the two colors join at the edge there is a slight intermingling of the colors but when the gauge of the ma-

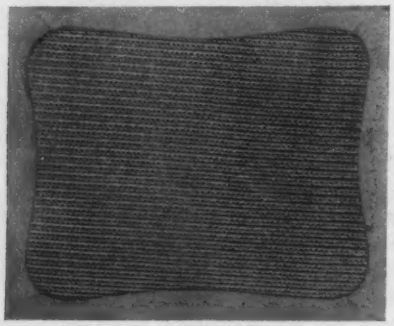


Fig. 4. Showing the Back Side of a 2 and 1 Fabric.

chine is finer and the yarn counts thinner this mixing is reduced to a minimum and is scarcely discernable. In other cases the blending of the two colors at the join in this way rather improves the effect, particularly in the case of two strongly contrasting colors when it exerts a modifying influence at the join.

In the warp loom it is simple to produce vertical stripes of color, for these are just arranged as desired on the warp beam. When the effect is obtained by a large lap of the guide bars however, these styles are necessarily of a horizontal nature and have to be turned round a right angle in order to give a vertical effect. In such warp loom fabrics the stretch of the fabric in the direction of the width is generally greater than that of the length, and fabrics turned at right angles show a tendency to droop when in wear. If they are worn as worked, there is usually greater elasticity in the width than the length and this is an advantage for body garments which can adjust their shapes and widths to individual variations of figure and bust within certain limits. The style of pattern in Fig. 3 is made in a cheap grade of woolen yarn and such cloths are largely employed for cutting into ladies' coats, worn loosely to give greater warmth when the person is working about the house. It is also a valuable auxiliary item of clothing when used as an intermediate, having a denser woven outer garment on top. The combined result in heat retention is very marked.

The pattern given in Fig. 4 shows the back of the fabric as it is thus most effective. It is an example of a warp loom fabric where the threads are arranged through one guide bar having a two and one lap, that is the threads are laid under two needles and over the third. This takes place in the direction of the right and left alternately and

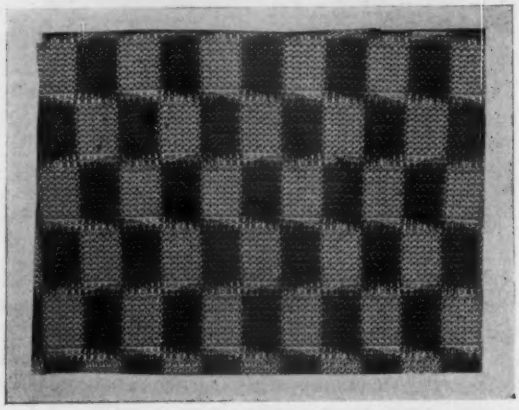


Fig. 5. A Block Effect in Two Colors.

as a result, on the wrong side of the pattern, we have a very effective ridge produced. The material employed in this pattern is lustrous artificial silk and the longer floating threads on the back give a much denser fabric, and on the wrong side there is a very lustrous effect running in cross ribs. This fabric when turned round a right angle gives a very attractive style and there is a bright lustre. The cloth is firm and rigid in both width and length and this style of lap is one of the best methods of creating heavier and denser fabrics on the warp loom. It is analogous to what one obtains in weaving when the number of intersections of a weave are reduced and larger floats of warp or weft are rendered possible; the floating threads can be laid more closely together to increase weight and bulk.

Figure 5 illustrates another style of design on the plain warp loom which has been much in demand during the present season. Two fancy colors are used and these

threads are drawn through the guides of one bar six of tan color alternating with six of blue color. Ten courses are worked with the ordinary one and one lap to right and left alternately which gives alternating stripes of blue and tan. At the eleventh course the guide bar is moved three needle spaces towards the right to lap its threads and after one course is worked the bar is moved a space of three needles further in the same direction. This reverses the colors in the stripe so that all the way across the blue is now working on the needles which the tan occupied and vice versa. This new order is continued for ten courses. After this the movement is reversed and the guide bar is shogged three needle spaces towards the left for the next lap, and after a course, the bar is moved a further distance of three needle spaces when the bar is back to the starting position and works ten courses as before when the rightward motion is repeated.

The reason for making the break in the pattern in two stages is that a lap of six needle spaces at one bound would

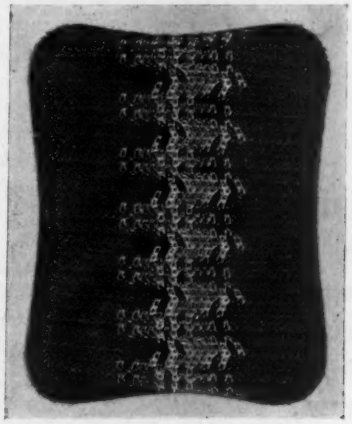


Fig. 6. Another Vertical Stripe Effect.

certainly impose a severe strain on the strength of the warp threads and further such a long stretch of lap would tend to create a blemish in the texture and would seriously weaken it. On the face of the fabric the lap of three is very little noticed nor is the blur observable unless it be subjected to close scrutiny. The lap over three needle spaces is more marked on the back of the fabric, as is the case in most patterns the back of the cloth is the best side to examine in all cases of analysis as the back is generally free from any raised fiber or special pressing in finishing. The style of lap in this pattern is most effective and such designs have been in considerable demand for the ladies' dress goods trade. Examination shows that there is almost no stretch in the direction of the length while the pattern yields only slightly in the direction of the width.

A further example of a lap which makes a stride of several courses at one bound is illustrated in Figure six which is a more stirring style of jazz pattern sought after for scarves and shawl effects. This stripe is made up of a brown ground color with the fancy threads arranged in the guide bars at regular intervals in the following order: 1 white, 1 black, 1 white, 4 blue, 1 white, 1 black, 1 white. This could be worked with a simple one and one side lap and made to give a vertical stripe effect, but in this case the guide bar is given a very wide style of lap and the result is that the breadth of the effect of the colors in considerably extended in effect. The details of the shog are as follows: shog five needle spaces towards the right, shog five spaces back again at the next course, shog four to the right, further two to the right, after which shog one back to the left, followed by five back to the left when the bar is again in its starting position ready to repeat the arrangement. These large laps of the guide bar are very effective and such patterns have been in demand in imitation of the Paisley shawl style of knitted warp which has recently experienced something of a revival.

Stains and Discolorations on Silk Hose.

Uneven dyeing of silk hose is chiefly due to the imperfect removal of the sericin from the raw silk. The remedy is to degum the knitted hose with soap dissolved in soft water. After the hose has been degummed, it should be thoroughly rinsed. The use of oils for degumming is not to be compared in effectiveness to the use of a good soap, especially one made of a good quality of olive oil.

In degumming, care should be exercised not to subject the hose to prolonged boiling, since excessive boiling of silk in a soap solution is likely to cause a splitting of the silk fibers, resulting in a consequent impairment of the yarn.

Another point to observe during the preliminary wet treatment of silk hose is the possibility of a discoloration occurring, the origin of which is difficult to trace. Every effort should be made to prevent the silk being discolored. It is to be remembered that silk has a marked affinity for coloring matters of all kinds, and that it is of frequent occurrence that silk becomes discolored by being contaminated with traces of iron, or, by seepage of solutions from between the staves of dye tubs or by being brought in contact with the acid soaked wood of skips, trucks and barrows. Iron discoloration appears to be the most common.

Oil stains are also frequent, and it is better to keep oil away from undyed silk hose, than to attempt to remove the oil by boiling it out with the aid of a soap solution. Silk has a decided affinity for machine oils, and the removal of oil absorbed by the silk is not easy. In fact the presence of the oil shows up very distinctly on the dyed and finished hose.

In the wet treatment of silk hose, the best practice is to make use of soft or softened water. This contributes more than anything else to the silk retaining its characteristic handle. This is due to the removal of lime, magnesium, or iron salts in water which would otherwise be hard. The presence of hard impurities causes the formation of corresponding insoluble soaps with the fatty acids of the soaps used. These insoluble soaps firmly attach themselves to the silk fibers and impart a handle which is at once characteristic and extremely difficult to remove, and at times, causes a discoloring deposit on the surface of the fibers, discernible under the microscope. Soft water is essential to good work on silk or mixtures of silk with other fibers—*Dyestuffs.*

Carl Epps to Manage Tennessee Mill.

CARL EPPS, superintendent of the Climax Hosiery Mills, Athens, Ga., has resigned to take charge of the Weiss Hosiery Mills, Cleveland, Tenn., which were recently acquired by Clyde Wilkins, of Chattanooga, and Shreve & Adams, of New York City.

BLEACHERS!

Can Cotton be bleached with Solozone?

Yes it can, and should be, if you want
strong goods,
soft goods,
permanently white goods.

But the Solozone bleach costs more?

Not necessarily. So many costly operations, so much water and power can be cut out, and so much damage and unevenness avoided that the difference in cost, if any, is negligible.

How can I investigate without much trouble?

Write us. We will indicate how to arrive at a definite conclusion without much trouble or expense.

THE ROESSLER AND HASSLACHER CHEMICAL COMPANY
713 Sixth Ave. New York, N. Y.

Needs Stop Motion for Ribbers.

EDITOR COTTON:

I would like to know whether or not anyone has ever been successful in devising a practical device for stopping a ribber shortly after it cuts a hole in goods or breaks a needle. I have been in the knitting game seventeen years, but to my knowledge I have never seen or heard of a device that would do this successfully and without fail immediately after the cut place leaves the needles. Undoubtedly a device that would do this successfully would pay for itself many times over in preventing waste on ribbers during even one year. Let's hear what others have to say regarding this through "Knitting Kinks."

I would be much interested in having this subject discussed, in case no one knows of such a device, along the line of the possibilities of such a proposition and its advantages and what it should do. G. T. (ILL.)

Unevenness in Dyed Rayon Underwear Fabric.

EDITOR COTTON:

I recently received from a fellow mill man a sample of dyed rayon knit underwear cloth which showed unevenness, and he wanted to know whether this could be remedied in the dyeing; also what treatment was suitable to even up goods showing such unevenness; and whether the cloth could be made less harsh.

In answering him, I told him there are several causes for unevenness in the dyeing of rayon. The dyestuffs may have been added carelessly or not thoroughly dissolved. The wrong selection of colors has caused uneven dyeing, especially when dyeing compound shades. Many direct colors which dye satisfactorily on cotton have a tendency to go too quickly on rayon. This is especially true when such colors are to be used for final shading.

The cloth may lie around after the scouring, so long that it partly dries out. If the cloth is not wet out again thoroughly just before dyeing, it will come out shaded, at least in light and medium shades, the dyestuff going first on the wet places, leaving the dry places lighter colored.

Too much salt added at once will cause the dyestuffs to be forced on too quickly and unevenly.

Temperature is a big factor in dyeing rayon. If raised too quickly the color will again go on the fibers unevenly, especially in light and medium shades. Temperature variations in the machine will also cause differences in the shade.

Soap left in the cloth after scouring and not thoroughly washed out will cause an uneven condition.

We invite our readers to make use of this department for the discussion of any and all problems arising in connection with the knitting mill from the office to the packng and shipping departments. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All accepted contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

The sample of rayon in question had the appearance of cloth—indicating that it had laid around after the scouring for too long a time, being dried out and not wet again thoroughly before dyeing. However, any one of the other causes mentioned might have its effect.

A method of leveling shaded dyeing that is easier and cheaper and that gives much better results than soaping, is a 10 to 15 minute treatment at 140 to 160 degrees F. in a bath slightly acidified with muriatic acid, one pint per 200 gallons of water.

To restore to the original shade, a little sodium carbonate (soda ash) is added to the bath. If shades are too uneven to be leveled, the rayon should not be stripped, but should be thrown into a dark shade.

Any harshness in the goods will no doubt disappear when the other trouble is found and corrected.

CONTRIBUTOR NO. 699.

A Kink for Drilling Drum Cams.

EDITOR COTTON:

Here is a kink on drilling drum cams for Scott & Williams Model K machines which your readers, if not personally interested, may pass along to the man who might be able to use it. Every fixer on Scott & Williams knitting machines knows that to drill holes accurately in the drum cams of the Model K machine is more or less of a difficult job without a satisfactory clamp or fixture for holding. Here is an idea that I found will help. I took the lower take-up sheave wheel of a regular Wildman ribber—a discarded one may usually be found around most any mill using these machines—and sawed it in half with a hack-saw, squaring the bottom or sawed surface so that the half section will stand on edge at right angles to the face plate of the bench drill. I found that the groove of the wheel rim makes an excellet holder for any average drum cam, as the curve of the cam fits the curve of the wheel, and the

A Disastrous Fire

Gutted A Little Shop in Willimantic, Connecticut

. . . and with it plans and patterns of the latest developments in silk-throwing machinery. Tools, drafting instruments, partially assembled machines—representing the entire capital of an ingenious inventor—were reduced to a smouldering, twisted heap of scrap. That was in 1876.

In the little Connecticut whaling village of Stonington, inventor John E. Atwood and his son Eugene Atwood, started anew with money borrowed from outside sources. Floor space was leased in a small stone structure that had been used for manufacturing rifles during the Civil War.

Only true devotion to ideals overcame the discouragements of those first days. Patterns required before orders could be secured and work started were made largely from memory. Many were necessarily discarded and others designed to take their places.

The growth and development of the great silk industry was made possible by the sturdy characters and perseverance of just such men as the Atwoods . . . industrial path-finders! Today Atwood achievement stands in the form of two great manufacturing institutions on those same historic sites, producing eighty per cent of all the world's silk-throwing machinery.

ATWOOD MACHINE COMPANY

Trumbull Street Stonington, Conn.

Winders Water Stretchers Reels
Doublers Twist Spoolers Warpers
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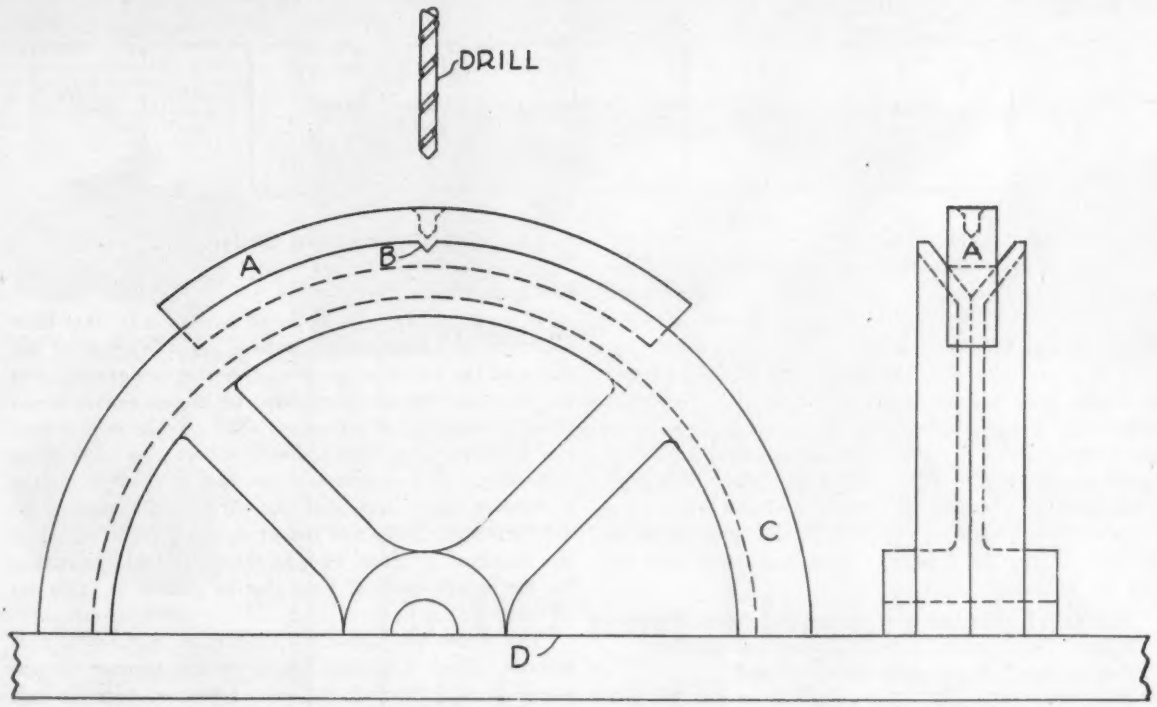
Southern Representative
W. A. Kennedy, 1106 Johnston Bldg., Charlotte, N. C.

New York Office
267 Fifth Ave., New York City

Western Representative
E. G. Pauls, P. O. Box 67, Inglewood, Calif.



flange edge will keep the cam from turning.

To do this drilling a man should take a square and set it on the face plate, in line with the center of the wheel, so as to find the right place to mark a notch at the top of the wheel. If the drilling is done at this point, the hole will run true. The accompanying sketch will show all of the necessary details. In this sketch *A* is the cam block; *B* the notch indicating the center line; *C* the sheave wheel; and *D* the bench drill platen. It will be noted that the drilled hole is only shown as "spotted" while in practice it would be drilled clear through the cam. However, I thought it might be plainer to the reader this way.

CONTRIBUTOR No. 1511.

What Causes a Crooked Stocking?

EDITOR COTTON:

I want somebody, through "Knitting Kinks," to give me a good answer on what causes a crooked stocking—that is, a stocking coming out of the machine with a twist in it. We had this trouble considerably, and have worked to reduce it, but I will appreciate some other fellow's ideas. ideas.

One thing, a local condition, which we found to be the trouble, was that all of the needles were not the same size, some of them would be 12/1000 inch off, which of course would make the stocking loose on one side. Another thing is that if the throat of the sinker is too thick, the stitch will be too loose, and if too much is cut out of the throat, the stitch will be too tight. Another cause is a cylinder that is not level.

In addition to the foregoing, if any readers have any suggestions as to what could cause this kind of a stocking, or if they have any experiences with this difficulty, I am sure the readers of "Knitting Kinks" would be interested if they would tell about them. H. Y. (N. C.)

Uneven Stitches in Full-Fashioned Work.

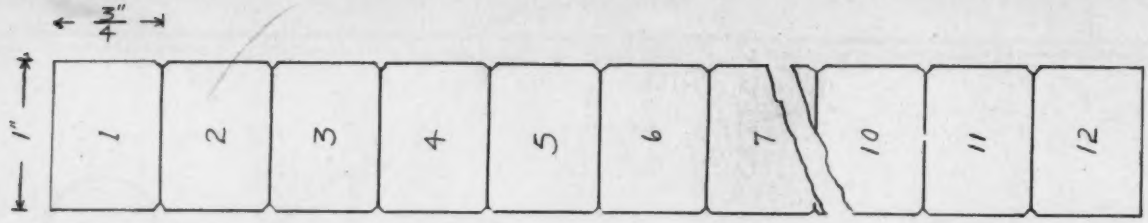
EDITOR COTTON:

I am interested in the two letters in the May issue of COTTON that refer to an uneven stitch in full-fashioned fabric, written by "Contributor No. 526" and "Contributor No. 527." As the letters infer that the writers had seen samples of the fabric, I am led to conclude that the old full-fashioned term, "slur gall" is evident.

It would be presumptuous on my part to attempt any correction of the suggestions sent in, and I do not wish to appear in that light, as the letters show an earnest desire to help the other fellow, and no doubt the trouble may be caused by improper conditioning or by "twist" in the slurcock or by a combination of both toward an imperfect fabric. This is not the point I am aiming at in this letter.

As one writer said, the full-fashioned industry is new to the South, and perhaps if someone whose life has been spent in this industry could find time to write, we might be able to find the necessary common ground over which to air our troubles. To this end it is imperative that we have a clear understanding of terms as applied to the different machine parts that would have to be discussed. "Contributor No. 527" mentioned some parts but had not fully covered his suggestions by using names that are common to the industry, thus making it hard for others new to the industry to fully understand his drift, and so with humble apologies to him I would like to use some parts of his letter to illustrate, as follows:

He says, "In the setting or adjusting of the machine, there is a clearance left between the sinker head and the sinker butt when the sinker has reached the end of its normal movement inward." He then goes on to suggest an adjustment which may be all right, if properly understood by the new man in the business who is making the inquiry, and in detail "Contributor No. 527" takes into his



suggestion the following parts:

On top of the "Head," the term given that part of the machine holding the sinkers and dividers, is a brass plate called the "Falling Bar," held in place by two or more screws, varying with the type of machines, this falling bar is the stop plate for the sinkers, and also it is the leveling or evening plate against which the "Catch Bar" forces the sinkers and dividers, completing the dividing of the loops and evening them to equality in size before the needle beards engage them to draw them down. This falling bar is adjustable and great care must be exercised when using it for correction, as it will "throw off" the catch bar if too far back or too far forward. Thus we would start off with the following definitions:

Slur Cock: The cam that forces the sinkers forward.

Head: Brass section holding sinkers and dividers.

Falling Bar: Brass plate on top of head.

Head Star: Knurled wheel screw behind the slur cock used for adjustment of the stitch.

The suggestion which "Contributor No. 527" made to place a divider between the sinkers and the falling bar to find the amount of "room" or play is all right, but that would not correct the twist in the slur cock as illustrated so well on page 745 of the May issue. To correct that, draw the machine partly across, testing with the pliers to find if the front of the slur cock is even at each end, and if it is uneven, draw all the way across, with the needles down, then with a long punch and hammer, carefully tap back the end that is too far forward, drawing the course several times if necessary, and tapping until the slur cock is level, as proved by the pliers and sinkers, showing an equal amount of "room" when the slur cock has been leveled up. Then a divider of the same gauge as the machine may be placed in front of the sinkers, between the front of the sinker heads and the falling bar, and should there be too much room, turn the head slur cock "down," that is, toward the falling bar, and if there is a difference at each end of the head, find out if the falling bar has been moved forward due to something getting between it and the sinkers, forcing it out of place. This would make it necessary to readjust the falling bar.

This is not all that could be said regarding slur galled fabric, but it may lead to some discussion that will help us all, and a common understanding of the terms that belong to the industry will be a long step forward toward the best means of enabling the old-timers in this so old and yet so new industry, to help the new adventurers, who by this time are perhaps beginning to feel as though it is much more complicated than it looked at first. I sincerely hope we can get together so as to fully understand each other.

CONTRIBUTOR No. 2605.

"A modest amount of water can turn the biggest dynamo if it lands with enough force."

A Chain Gauge.

EDITOR COTTON:

It should be the custom in all hosiery mills that have semi-fashioned machines to make a periodic check of the chains of the machines to see whether they are according to specification. Standardized sizes and lengths cannot be obtained if these chains are not all alike. Taken as a general rule in most mills, style and size changes are made quite frequently. This of course is done in part by changing the amount of links already in the chain to the amount desired according to the new size or style. This job is that of the machinist or fixer, who, of course, is held responsible for the proper count of links that he puts in or takes out of the chain lay-out.

The writer has under his supervision a force of machinists. Each machinist has a certain number of machines to take care of, and each machinist does his own style or size changes as they come up. We make a periodic check on the chains every three months, and out of one lay-out of three hundred machines, always find as many as ten to fifteen machines off count. This of course is due to the machinist who miscounts during the time he is making the change.

One thing we have done to bring the chances of miscounting to a minimum is to use a gauge stick, which is shown in the accompanying illustration. This gauge is divided up into squares, each the size of one link. This can be divided up into as many squares as one wishes, but as a standard gauge I have used one of about twelve spaces. This gauge is put alongside the chain on the machine, and as the chain is pulled around to its various parts, note is made as to the number of links in that part of the chain. We find the gauge enables us to check our chains in half the time it formerly took to do this.

If anyone makes one of these gauges, he should notch the edges between each square, otherwise it will be difficult to see the spaces, owing to the fact that the gauge becomes greasy in use.

CONTRIBUTOR No. 41.

Seeks Opinions of Other Knitters.

EDITOR COTTON:

The question was asked recently whether it added more to the wear of a hose made on a Model K, Scott & Williams, 240 needle machine—a hose that was formerly made with a fine strand of tram silk, having art silk on the back—if this should be reversed by putting the art silk on the face of the hose and the tram silk on the back. I will say I believe the wear would be improved, but such a change is done mostly to give the hose more luster and to save waste and seconds, for the reason that in knitting with tram silk over art silk the strain or tension comes on the tram silk

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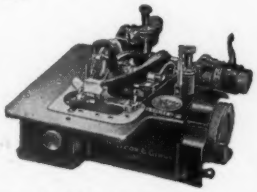
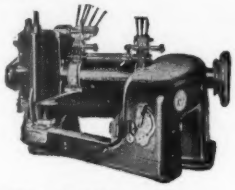


FLATLOCK MACHINE
for making an absolutely flat seam, which also may be made specially ornamental by the use of sewing supplies varying in character and color.



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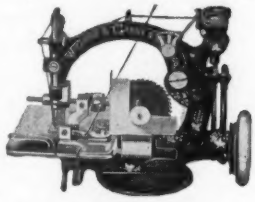
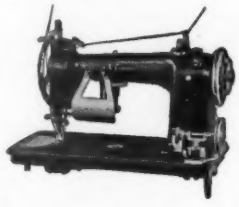
that provides an attractive finish for the edges of shoulder straps. It makes the fabric of the garment provide its own trimming, and is not disturbed by laundering.



ZIG ZAG MACHINE
for forming an ornamental zig zag effect, for instance on shoulder straps, is appropriate and effective.



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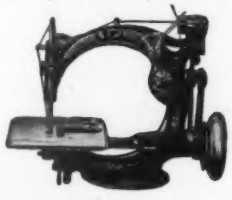
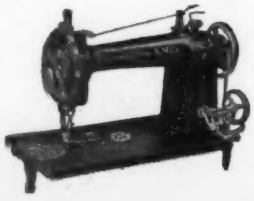
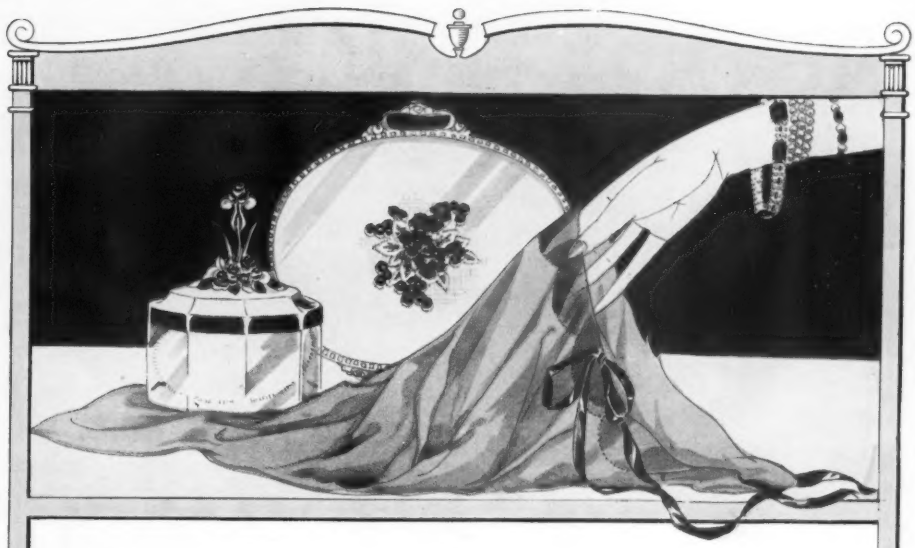
with Registering Measuring Tension, for various stitching operations; for instance dividing bottom hem on bloomers for elastic heading, also for sewing on the labels.



LOCKSTITCH MACHINE
for sewing on shields, attaching shoulder straps, etc.





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which has a tendency to break more often, where, if reversed, the tension comes on the cheaper yarn which seems to stand the strain better than the tram silk. It does not mar the appearance of the hose nor the wear. A great many prefer the art silk face on account of the luster.

C. H. (CANADA).

Kinks and Suggestions on the Model K Machine.

EDITOR COTTON:

In taking up the question of kinks and suggestions on the Model K machine in this letter I have some more details to talk over beginning with the slackening cam and its adjustments.

Adjusting the Slackening Cam.

The purpose of the slackening cam is to slacken the fabric in the short butt needle side of the double sole. This is necessary in order to keep the stitch the same in both the long and the short butt needles. This adjustment is obtained by having the long butt sinkers on the short butt needle side and the short butt sinkers on the long butt needle side. The slackening cam misses the short butt sinkers but pushes the long butt sinkers in a little further than the sinker cam, resulting in a looser stitch. The adjustment is gotten on the slackening bar plate No. 7040, which is fastened on the gap closer thrust bar No. 7275.

Sometimes a looser stitch on the short butt needle side cannot be obtained in the foot with the ordinary adjustment slackening cam. It is then necessary to cut the groove in the sinker cap in a little more, thus allowing the slackening cam to go in a little further, loosening the fabric a little more. It is then necessary of course to set the gap closer thrust bar plate No. 7040 in a little further so that the slackening cam will be held in. Take care to have the gap closer thrust bar plate work freely as the machine is going through the various changes.

The Thrust Bars.

The thrust bars are as follows left to right. Number 1 is the gap closer thrust bar No. 7275. This controls the throw of the gap closer and also operates the double sole slackening cam No. 7439.

Number 2 controls the throw of the yarn changing finger No. 1 which is the splicing finger.

Number 3 operates the yarn changing finger No. 2 which is the inside of the welt.

Number 4 controls yarn changing finger No. 3 which is the heel and toe yarn.

Number 5 controls yarn changing finger No. 4 which is the outside of the welt and top of the leg.

Number 6 is for the yarn changing finger No. 5 and is the boot and foot of the stocking.

Number 7 controls the shear lever No. 8244.

Number 8 is the auxiliary cam thrust bar No. 7280. This controls the throw of the needles when going through the set up and ravel stop.

Number 9 is the takeup thrust bar No. 8289. This controls the takeup of the yarn when on the heel and toe and also controls the throw of the welt presser, through all the changes of the stockings. The upper end of this thrust bar is connected with the yarn takeup bracket No. 5749. This bracket is adjustable back and forth, so that if this thrust bar should bind the trouble generally lays here. Moving the bracket back or forth whichever it may need to allow the thrust bar to work freely, is the remedy.

Number 10 controls the throw of the transfer loop forming cam operating lever No. 5551.

Number 11 controls the throw of the transfer cam operating lever No. 5560.

The first eight thrust bars are held in place by the upper guide plate No. 7041.

The last two, No. 9 and No. 10, are held in place by the auxiliary cam thrust bar guide No. 8256 fastened onto the auxiliary cam bracket.

Very little trouble should result with these thrust bars, with the exception of their binding, and a solution to this can be found by checking them over.

The Gap Closer.

The functioning of the gap closer is to close the gap at the throat plate when on the level on the heel and the toe. This is necessary so that the needles that are up out of action when on the heel and toe will not break the latches off. The adjustment for the gap closer is gotten on the gap closer adjustment plate No. 7034 on the gap closer thrust bar No. 7275.

In time this gets out of adjustment, allowing a small opening in the throat plate, causing drop stitches in the gores and instep of the stocking.

When fitting a new gap closer to the machine, as a general rule the gap closer is a little large and it is necessary to spring it in a little to fit. This must work freely, without binding in any way. Machines that have been run for a considerable time, it will be noticed, receive considerable back and forth motion. This is damaging to the cylinder needles, so this play must be kept out for the best results.

The gap closer ring clamp No. 7110, should be set so that the gap closer rides freely without binding but do not set this too high, as this leaves too much play.

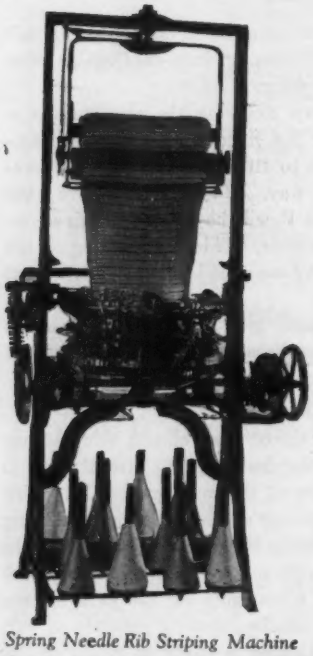
The Throat Plate.

The proper fitting of a throat plate should be about one sixteenth clearance from the front of the throat plate to the front edge of the hooks of the cylinder needles. This should allow the proper spacing of yarns as they are being fed to the needles; also for the reciprocating motion of the yarn when on the heel and toe. If the plate is set back further than this, there is a tendency for the yarn to miss the hooks of the cylinder needles, causing cut-outs of various kinds. Drop stitch trouble is likely to result on the long butt needle side in the foot of the hose. This is due to the long butts being drawn down out of action when putting in the double sole. When the plate is adjusted so that there is less than one sixteenth clearance, breakage of the hooks of the cylinder needles will result. Also, this will not give enough room for the yarn to take-up when in the heel and toe. Cut-outs in the set up of the hem will also result.

The Up-Pick Springs.

It is my opinion, from experience, that the springs with which the manufacturers equip the up-picks as they leave the factory are entirely too stiff.

One advantage, of course, in having a stiff spring is that it holds the picker in its place. I have found that a weaker spring, also one which is long enough to work snappy, is the best. All that is necessary for these pickers is that they will lie steady when they are thrown into action by the connecting rod. The advantage of having a weaker spring does away with the breaking of the butts of the cylinder needles when on the heel and toe.



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If the lever spring puts too much strain on the walls as the needles are being picked up out of action, it results in needle breakage, especially so where the walls are roughened up from wear.

The Yarn Fingers.

The Model K machine is equipped with five yarn changing fingers. They are numbered beginning with the left side, facing the machines as follows:

Number 1. Splicing or double sole fingers. This inserts the reinforcing thread in the bottom of the foot.

Number 2. This finger is generally used for the inside of the hem.

Number 3 is used for the heel and toe.

Number 4 is for the outside of the hem and the top of the leg.

Number 5. This finger is for the boot and the foot of the hose.

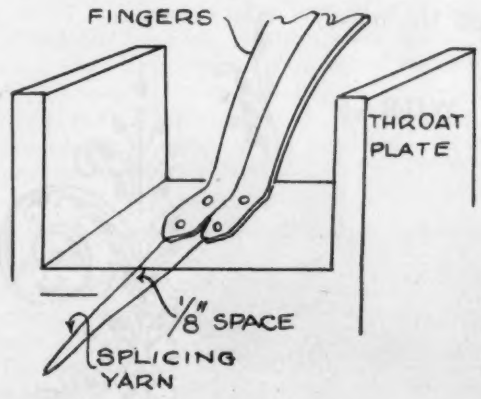
These fingers with which the machines are equipped as they leave the factory, are of the proper length, although there are many cut-outs and imperfections caused in the machines in the mill by having improper fingers in the machine. This is done by the machinist from time to time and should be checked closely. In time, grooves are worn in the bottom of the fingers, due to the wear from the yarns, causing the yarns to pull out or cut out of the machines, and causing of course, imperfections.

The fingers should be taken out of the grooves and dressed down with emery cord. If it is necessary to grind some off of the bottom of the finger to get the groove out, take the same amount off the heel of the finger so that the bottom of the finger will not lay too high from the top of the throat plate.

The spring of the fingers should be snappy.

Plaiting Trouble in Foot of Hose.

One of the difficult things to fix on a Scott & Williams, Model K machine is the plaiting trouble on the short butt



needle side in the foot. As a general rule this plaiting is more evident on the going-in side than the coming-out side of splicing. As every fixer should know, the most important feature of perfect plaiting is the tension on the yarns. The yarn which is plaited on the outside should have more tension than the underneath yarn. The spacing of the yarns as they are being fed to the needles, of course is the next step.

The splicing yarn, is fed in the left corner of the throat plate. The main yarn should be separated at least 1/8th-inch from the splicing yarn as is shown in the illustration.

These two are the most important features. Bad plaiting

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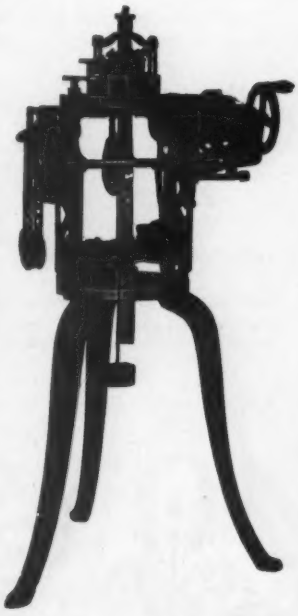

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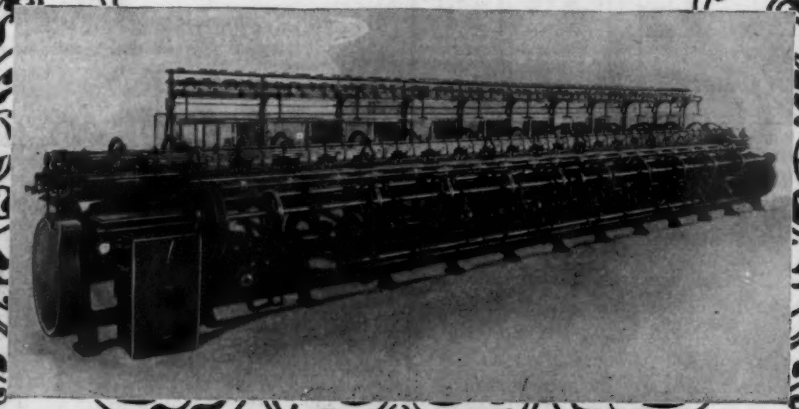

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will also be caused by needles being out of line, the welt presser being set in too far, the slackening cam not working properly, or too much tension on the splicing yarn.

The Sinkers.

The sinkers cast the loop off the hooks of the cylinder needles, after the stitch has been formed.

One of the biggest causes of sinkers wearing out rapidly is due to the tension applied to the yarn. That part of the sinker which the yarn lays across when knitting, and which is the throat of the sinker, becomes grooved due to this tension gradually cutting the fine edge of the sinker. When the sinker gets in this condition it is unsuitable for knitting, cut-outs of all kinds result, with imperfect knitting.

Tension of the yarn should be applied with this fact in mind.

Extending the Chain Bracket.

Certain styles of hose take more chain links in the layout than do others depending upon the style being knitted.

For some styles, the regular chain bracket is not large enough to take care of all the links. A good way to make this bracket longer is to get a piece of flat iron about a foot and a half long by two inches wide. Drill two holes for two bolts to fasten onto the upper end of the chain bracket. Drill another hole the size of the sprocket shaft in the end of this extension. Insert the sprocket shaft in this hole. This extension can then be moved up or down, as is desired.

Sinker Band Wire.

There is more or less trouble with the sinker band wire of the sinker tops of the K machine. These bands frequently become broken, causing waste. These bands break, due to several causes. Where the band passes by the front of the central cam on the sinker top, there sometimes is not enough room for the band to pass by, causing it to scrape and eventually break. This is generally the main trouble. The remedy of course is to take a little off of this cam.

Having this band too tight is another cause. There should be about three quarters of an inch of stretch to this band, when inserting on the sinkers.

Due to the constant running of the machine, these bands gradually become worn and crystalized. When this happens, of course breakage results.

Specifications.

The purpose of a specification, is to show the requirement and adjustment for producing a certain type of hose.

This specification should be as simple as possible, but still showing all that is necessary, so that no mistakes will be made.

The specification should include the type of the machine, the size and diameter of the needles, the number of links for each part of the hose, their catalogue numbers, including the changing links, a space for the links used in the foot of the various sizes and a space for remarks for special information.

Specifications should be kept in a prominent place, where both the operators and the machinists can see them at all times.

These remarks on specifications apply, of course, to all makes of machines. I merely included the suggestion because it came to my mind. Now, looking through my note book I find just about enough material for one more letter, and that will come later.

CONTRIBUTOR NO. 445.

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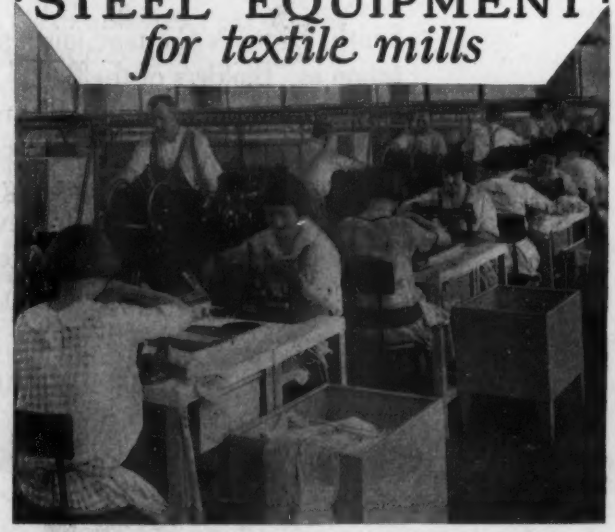
STEEL EQUIPMENT

for textile mills



Lupton Bar Topping Tables and Work Boxes in use at Nos-Equl Hosiery Mills, Inc., Reading, Pa.

SILK AND R

Skein Dyei

The Skein Dyer with h

Skein Dyeing Machine Type H. S.
120 reels, made up in twelve sections
arranged 10-10-10-10-10-10
10-10-10-10-10-10
Gear guard has been removed to show method of driving.

Smith, Drum & Co. maintain their reputation as "Builders of the Best." The use of PYREX reels on this Skein Dyeing Machine is only one indication of the extent to which our Engineering Department went in their effort to develop the very best machine on the market for the dyeing of silk and rayon in skein form.

This new SMITH-DRUM Skein Machine, type H.S. embodies many other exclusive features just as valuable as the wonderful new PYREX reel.

Hand dyeing is now no longer necessary. It is expensive and uncertain. This machine will give you better results in dyeing, less trouble in winding and at lower cost. Built with capacity of from 25 lbs. to 600 lbs. per batch.

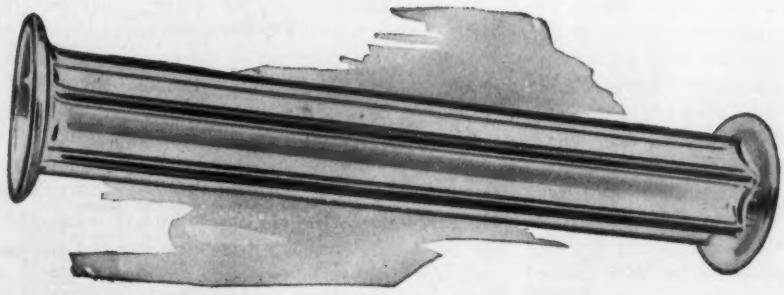
Write for full details of the PYREX reel Skein Machine built by SMITH-DRUM.

Smith Drum & Co., Established 1888 **Philadelphia, Pa**

RAYON

ing Machines

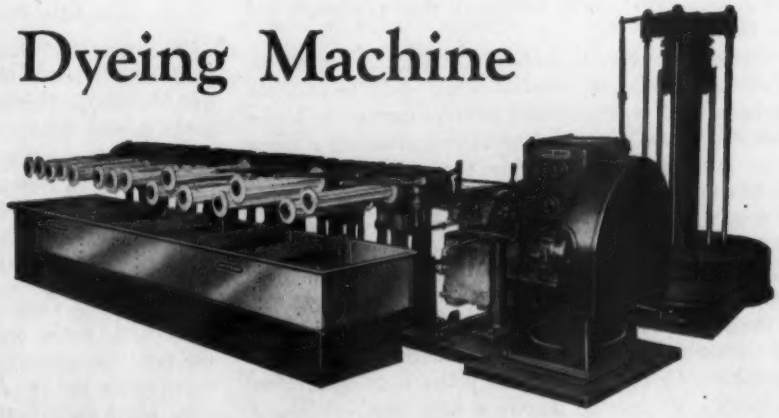
the "PYREX" Reel



SMITH DRUM PYREX REEL

The Smith-Drum PYREX reel is made of the same material so extensively in the manufacture of cooking utensils. We have sole sales rights for this reel in the United States and Canada. PYREX reels are offered to the trade as original equipment only on the Smith-Drum Skein Machine. They may also be bought separately for replacements. We will gladly furnish one or more reels on trial for comparison with your present equipment.

SMITH DRUM Skein Dyeing Machine



Smith-Drum Skein Dyeing Machine. Fifteen reels made up in five sections arranged 5-3-3-2-2. This machine is so designed that additional sections may be added from time to time by simply bolting on to the original base plate. The Monel Metal tank is divided into five compartments by four removable monel metal partitions, so that it is possible to dye five different colors at one time when the partitions are in place or one large lot all one color when the partitions are removed.

The Yarn Market

Philadelphia, Pa., June 15th, 1927.

During the month just passed the cotton yarn market here in the long run has undergone a wholesome improvement, sales and the price situation both having experienced a substantial increase. At this writing it seems obvious that the spinners are in the controlling position, that is, so far as that is possible under the present marketing and purchasing conditions.

The way to the improved situation was not regular, however. The first of the four full weeks just gone by started out with comparatively low prices prevailing, but with very little supply available at the low quotations, the reduced rates coming more from pressure emanating in the purchasing end of the market. Consumers maintained a quiet, seeming disposed to wait out the market in the thought that cotton would undergo a reaction from the uplifting influence of flood conditions. There seemed to exist considerably less interest in the effect of the flood. There was a decline of note scheduled for May, but it was delayed and buyers seemed to anticipate that it would arrive with June, anyway. Prices during the week, especially in the coarser ranges, were shaded, the finer numbers up to 60s also being affected, and the market did not respond to the cotton price spurt which came the latter part of the week.

The next week constituted the transfer period for the condition of the market. Spinners started out with stiffer prices, which made goods harder to sell in view of the previous conditions. At the same time, business, particularly from out-of-town, came in some volume. For the most part, however, it appeared that business demands generally were easing off. Regardless, the spinners continued firm throughout the week, being aided by additional strength in raw cotton.

Results from the spinners' firm attitude came during the third week, which carried the market over into June, for there were still further increases in rates throughout practically the entire list, and shoppers found it more difficult to secure yarns cheaper than the accepted quotations. At the same time, there was no considerable rush to market. The shrewder buyers could not be interested in anything beyond short-time commitments. It was noticeable, however, that there was a definite change in the character of the inquiry, being less casual than previously had been the case.

During this week, business in the combed end of the list slowed down more noticeably than could be observed elsewhere. This was attributed in large measure to higher prices due to the Mississippi inundation removing a sector of raw cotton supply for the finer counts from the market, and buyers seemed inclined to wait for the reaction. At the same time, the spinners and dealers were insisting that the basis for the higher level of rates had been laid and that they were more justified than just to exist as a result of the flood conditions.

Dealers in the finer counts, as well as those handling the coarser numbers, took occasion during this week to demonstrate by figures that yarn prices had not advanced too swiftly, by showing that yarn rates were still considerably under cotton values proportionately.

The fourth week, leading up to the one in which this is written, saw a strengthening of the spinners' situation which left them without doubt in the saddle so far as the market was concerned. They seemed possessed of more confidence in their position than for some time. Prices are holding up without any appreciable increase in buying. The combed section refused to weaken because demand had slackened, as was mentioned.

Philadelphia quotations on June 13 follow:

Single Skeins.

4s to 8s	26½	10s	27
12s	27½	14s	28
16s	29	20s	30
24s	32½	26s	33½
30s	35		

Single Warps.

8s	27	10	27½
12s	28	14s	28½
16s	29½	20s	30½
24s	34	30s	36
40s	45 @46		

Carpet and Upholstery Yarn in Skeins.

8s 3-4 hard white warp twist	25½ @26½
8s and 9s 3-4 tinged tube	23½ @24½
8s 3-4 hard twist waste	23 @23½

Two-Ply Skeins

8s	27	10s	27½
12s	28	14s	28½
16s	29½	20s	30½
24s	33	26s	34
30s	35½ @36	40s	45 @46

Two-Ply Warps.

8s	27	10s	28
12s	28½	14s	29
16s	29½	20s	31
24s	34	26s	35
30s	36	40s	45 @46

Frame Spun Carded Yarn on Cones.

8s	26½	10s	27
12s	27½	14s	28
16s	28½	18s	29½
20s	30½	22s	31
24s	32	26s	33
30s	35	40s	45
30s double carded			35 @36
30s tying in			34

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	39	20s	43 @44
24s	46 @47	30s	49 @50
40s	58 @60	50s	62 @65
60s	72 @75	70s	83 @87
80s	95 @1.00		

Single Combed Peeler Yarn on Cones.

18s	41	24s	45
30s	48 @49	36s	50 @51
38s	53 @54	40s	55 @56

Mule Spun Carded Yarn on Cones.

10s	30½	12s	31
14s	31½	16s	32
18s	32 @33	20s	33½
24s	34 @35	26s	36
30s	39	40s	47 @48

Mule Spun Combed Peeler Yarn on Cones.

10s	40 @41	12s	41 @42
14s	42 @43	16s	43 @44
18s	44 @45	20s	45 @46
22s	46 @48	26s	48 @50
28s	50 @52	30s	52 @54
36s	56 @58	38s	58 @60
40s	60 @65		

Erie Ball Automatic Engines.

The Erie Ball Engine Company of Pittsburgh, Pa., have recently issued Bulletin E-825 descriptive of the Erie Ball Automatic Engines, especially as to their adaptation in the driving of cotton gins. Announcement has also been made by this company that the Continental Gin Company of Atlanta, Ga., Birmingham, Ala., Dallas, Tex., and Memphis, Tenn., have been made their sales agents.

Now Has Two Factories.

The United Chemical Products Corporation of Jersey City, N. J., rather well known in the textile field through the lines they manufacture and market, advise that their organization has two factories: the main factory at Jersey City, and a factory which is operated at Pluckemin, N. J., as a subsidiary concern where all their dyestuffs are manufactured and shipped to the Jersey City plant.

The Knit Goods Market

Cross currents in the hosiery primary markets make it difficult to arrive at a wholly satisfactory conclusion as to the stage of trading generally. June showed a fair measure of activity in many lines, positive dullness in not many and conflicting situations in a few. Underwear interests safely turned a sharp corner, as to both light and heavy weights. There was further improvement in sweaters, and bathing suits responded promptly to any sharp fluctuation in temperatures, active and quiescent by turns. Tardiness of spring was responsible for deferred trading in strictly seasonal lines in each of the three major knit goods divisions, and over-production, or belief that there was, may be held accountable for mixed conditions in full-fashioned hosiery, which has been brought nearer to a competitive stage within its class. Extremes in opposite directions were seen in advances of almost 10 per cent in prices for low end cotton hose and declines in values of full-fashioned silk, with here and there a slight mark-up by manufacturers restoring the prices prevailing prior to the reduction two months ago following the downward revision by the Berkshire Knitting Mills. The future is regarded as promising of more satisfactory conditions than those prevailing in June, and likely to show little change during the summer months, the turn being due for early fall.

Whether there is any connection between curtailment in output of full-fashioned and a spurt of activity in women's seamless is purely a matter of conjecture. Relatively, there is as much overtime work in seamless mills as in full-fashioned, and necessarily less curtailment in the former than in the latter, for one reason there had been a material reduction in the number of seamless mills devoted to the manufacture of women's hose, while there have been many additions to the full-fashioned industry. It is not improbable that the June spurt in women's seamless was a reaction from a comparatively sharp decline in production earlier.

Based on reports from manufacturers representing around 62 per cent of the production reported for the latest industrial census, seamless output in the first four months of 1927 was 12 per cent less than in the corresponding period of 1926, and in this connection it may be stated there was an indicated decline of 10 per cent last year from 1925, from which it is to be inferred there were no cumbersome holdings of surplus seamless goods at the beginning of spring, while it is easily possible that stocks of full-fashioned had grown to beyond market absorption, this view being confirmed by steady dumping of heretofore standard lines at conspicuously sacrificial prices.

Full-fashioned production in 1926 gained 92 per cent, indicated, over 1924, and 31 per cent over 1925, the increases more than offsetting the declines in seamless by considerable, even after making allowance for an increase in population and with no gain in exports to take up the slack. But such showings have not materially checked expansion in the full-fashioned industry, more of which will be seen in the South than in the north.

That the current business in full-fashioned hose is not equitably distributed is shown in the fact that while a small number of mills in Philadelphia have been operating but three to four days a week, an equal number, some in the same city, are on overtime work schedules. Several mills in Reading also are maintaining extended overtime schedules, one operating night and day, another employing two nine-hour shifts of operatives and others at better than full time capacity with single shifts. According to their New York representatives, several mills in the South—two in North Carolina—find need for lengthening the day. Both are sold well ahead and one is in arrears with deliveries. A like report comes from some of the southern seamless mills making women's silk hose, two in particular operating 23 hours in 24. Of the Pennsylvania seamless mills, two are known to be crowded with orders, while some have less work ahead than a month or two ago.

Reports from manufacturers in the full fashioned division indicate that it is the smaller mills concentrating on a single number that are the better situated as to orders and steady operation. Their product is, mainly, seven and eight thread silk to welt, some faring right well with chiffon silk to top, all using 42 gauge machines as their standard, but employing just a few 45 gauge for chiffon work exclusively. Generally speaking, the busier seamless mills are knitting service weight hose of silk plaited on rayon—goods to pass over the counter for a dollar a pair. A mill putting all that can be crowded into a dollar stocking, whether of all-silk or silk-and-rayon to welt, and making nothing for any other price, is comfortably situated as to current and forward business, and a Philadelphia manufacturer of 300 latch needle silk is in the overtime class. From all of which it appears that there must be a reasonably good market for popular price hosiery of popular construction.

A Philadelphia manufacturer operating a small plant comprising 45 and 48 gauge machines maintains a sold-up condition. But this is by no means a criterion of the situation in very fine gauge hose. The output is sold direct to retailers. This manufacturer has 51 gauge machines of German build on order, and with their installation probably will knit ingrain silk. Another mill which supplies no criterion operates only 39 gauge machines and is selling the capacity production of a moderate size plant, and the mill is making money for the owners, who themselves are expert knitters and until a few years ago were on the payrolls of large establishments. While the product is sold as 39 gauge, a jobber patron of the mill puts it into distribution as 42, it is stated by a person who must be assumed to know whereof he speaks. As a matter of fact, considerable of the 39 of good construction is accepted by some not too discriminating buyers.

There is heard some talk of inquiry for ingrain silk full-fashioned hose, of which there is only restricted production. Ingrain might be attractive to the comparatively few manufacturers having very fine gauge equipment, for relief from the sharp competition in the dip dyed, but what little is heard of inquiry probably is nothing more than propaganda in behalf of interests whose identity has not been disclosed. Two or three nationally known manufacturers selling direct to retailers have a sustained call for the ingrain, one stating their sales are more satisfactory than is the business in dip dyed. Another, who says he intends to add ingrain to his line, possibly next year, is of the opinion demand will develop but slowly. It should

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HAMILTON, CANADA

More than ever before Men are wearing Fancy Hosiery

The widespread popularity of fancy stockings among men of today, is constantly growing, with the result that a greater variety of patterns is necessary. The manufacturer, who has the equipment that is capable of producing the greatest number of styles, with the least effort is sure of obtaining his share of business.

The Standard line of machines, with the various attachments, offers the hosiery maker a means of enlarging his field. These knitters have practically no limit in range of pattern change.

The pattern shown here was made on a Standard H Knitting Machine with the Attachment "R", style 2. This produces figure patterns in six colors. A real feature of this machine is the ease with which patterns can be changed. The operation is without the use of jacks.

Our catalog, which fully describes these knitters will be of interest to you. Ask us for it.

STANDARD-TRUMP BROS. MACHINE CO., *Wilmington, Del.*

James Building, Chattanooga, Tenn.

be knitted in nothing stouter than three-thread silk, he says, and on only 51 to 57 gauge machines. Women willing to pay the price for very fine gauge ingrain do not look for much service, using such a stocking for only semi-state occasion and not more than one or two such occasions at that.

As a commercial proposition ingrain hosiery would be almost an impossibility, with dealers expecting their small orders to be shipped out on a few hours' notice and calling for any one of several dozen colors. Manufacturers, to take care of business of this character, would have to carry yarn stocks of a variety of colors and be prepared to knit and dye to order many times a week, perhaps. It might prove profitable for a limited number of mills depending on a very exclusive trade. One or two such establishments are putting a part of their output under dealers' special packing, for finding an immediate outlet for small accumulations. A few weeks ago ingrain hosiery bearing a dealer's brand was being sold at a dollar a pair less than an identical stocking from the same mill carrying the maker's trademark was priced in a woman's specialty shop in the immediate vicinity. This incident would seem to indicate that present production of the ingrain silk is sufficient for meeting dealers' requirements. But it may be as easy to establish a fictitious demand as was the case with the black heel fad.

For the present, black and otherwise contrasting heel hose appears to be losing out even faster than it came into popularity early in the year, and it seems a safe guess that little of the novelty will be seen during the summer. Manufacturers say it still is in occasional call, but it is noted some are declining any additional orders, realizing that unless there be a revival of interest in the diversion, cancellations might exceed shipments. Some wholesale sellers declare they are unable to move any sort of contrasting heel at prices representing more than mill cost.

The fad had a short and snappy run while it lasted, and was opportune for putting pep into what otherwise might have been a comparatively listless market. It will be remembered as another reminder of the risk entailed in exploiting a novelty stocking and the importance of knowing when it is about at its peak and dropping it while it still is profitable.

From the early days of the full-fashioned industry novelty hose has been made and sold, and some of the effects of 30 years ago were as striking as the jazziest of men's fancy half hose of the present, but they never made much of a dent in demand for staples. Manufacturers who care for a plunge into the field of novelties doubtless will have abundant opportunity to satiate that desire before another 12 months roll around, and lace instep is picked as something to be expected to meet the craving for the distinctive. It seems not improbable that very sheer lisle mesh will attract some attention among the exclusive shops.

There continues a fair call for women's rayon hose coming more particularly from some of the southern mills naming attractive prices, but distribution appears to be in lighter volume. All-rayon is hardly a competitor of silk and rayon in combination, which is credited with giving greater service and supplying the luster of all-silk, but with restricted production should remain as a safe price proposition more especially for the rural trade, being on a plane in this respect with plain mercerized, prices for which have had to be advanced rather sharply. This would seem to operate in favor of rayon for a time.

Since the advances in some lines of cotton hose, jobbers have been running to cover for juvenile leg wear, with the result trading in this division is at a better stage. Children's hose for some time has been among the more active lines, and there is notably sustained demand for the flat full length, notwithstanding the market for sports length is at its peak for the year. There is severe competition in juvenile hosiery of nearly all descriptions, and its production in northern mills seems likely to undergo some recession in favor of the South. One of the better known Philadelphia manufacturers who is operating a branch in a southern town has under contemplation removal of the main factory to that section, following the example of the Miller Hosiery Mills, in Reading, for several months operating in Chase City, Va., and about to engage on a more extensive scale in Burlington, N. C. The Miller establishment makes only half hose, plain color silk and novelties for the half dollar retail price bracket.

Infants' sock lines will go on sale in New York in July for the 1928 season, according to the plans of several manufacturers. In fact, it is likely a few large distributors looked at samples from one or two mills in June. While there is some opposition to an early opening, it is held that jobbers who intend to canvass the retail trade in September will want to place orders for samples with the least possible delay. Few factors look for any business of moment to be placed before August, and by that time the market probably will go through with what was experienced in the last several years—shopping around by all sorts of buyers and confusion as to prices.

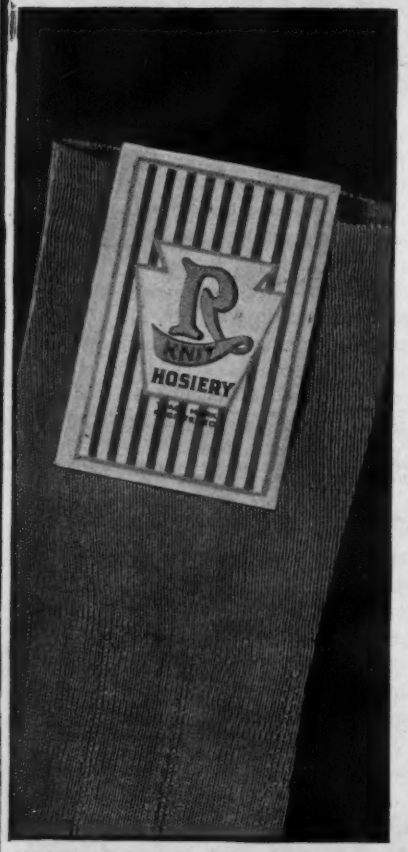
As to boys' and misses' lines, most manufacturers probably will come on the market without the formality of a stated opening—offering their lines when ready to do so and buyers seem ripe for business. Wool hose for juveniles seems to have been contracted for more freely than last year, and mills specializing in silk-and-wool goods are operating full tilt, those in the East being particularly well supplied with orders.

The outlook is for a brisk silk-and-wool fall and winter. There is heard expressed more satisfaction with forward business than with conditions in current trading, and some factors predict a decided improvement in the hosiery markets generally when fall trading gets under way. While there has been satisfactory business in popular price wool mixture hose, much additional business is expected from jobbers.

Except as to sports wear, plain and two-tone colors seem likely to prevail in women's, while patterns are being picked for men's. A jobber here and there has sent repeat orders for men's, showing they already are having some orders from retailers. The repeats come, mainly, from distributors who have exclusive sale of certain specific patterns in their respective trade areas.

Men's fancy half hose seems to have reached a somewhat precarious stage. The volume business is in half dollar lines, but, say manufacturers who take a pride in their product, jobbers are not willing to pay prices commensurate with the cost of frequent changes in machine attachments necessary for keeping pace with innovations in colors and patterns. Then, too, losses must be taken on designs that have been superseded by something rated more fetching.

That heavy losses have been sustained somewhere be-



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In jewelry, Tiffany alone expresses it. In motor cars, it is Rolls-Royce. In fashion, it is Paul Poiret.

—and in lithography it is KAUMAGRAPH!

"Lithographed by Kaumagraph" is the finest thing you can say about hosiery packages and packing. For the work is surpassingly fine.

And so you will find the finest hosiery manufacturers and jobbers come to Kaumagraph for box wraps and packing that dominate the dealers' shelves, that look as smart and perfect as the perfectly smart hosiery itself.

The very striking box tops and packing shown here suggest the character of work you can expect if you allow your requirements to be "lithographed by Kaumagraph." And the character of service is equally outstanding.

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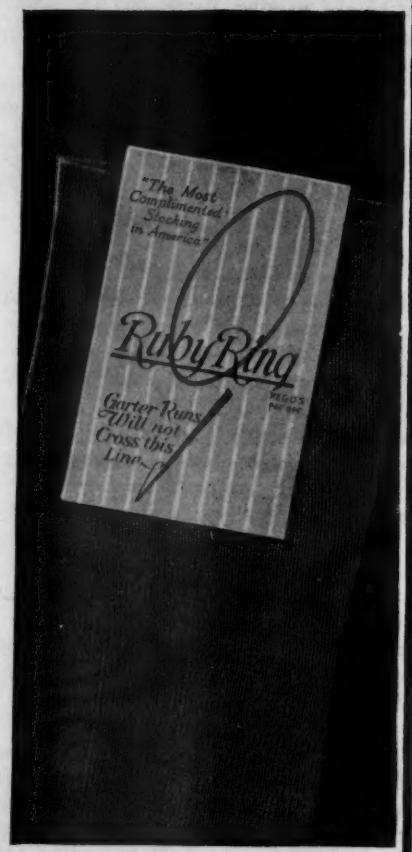

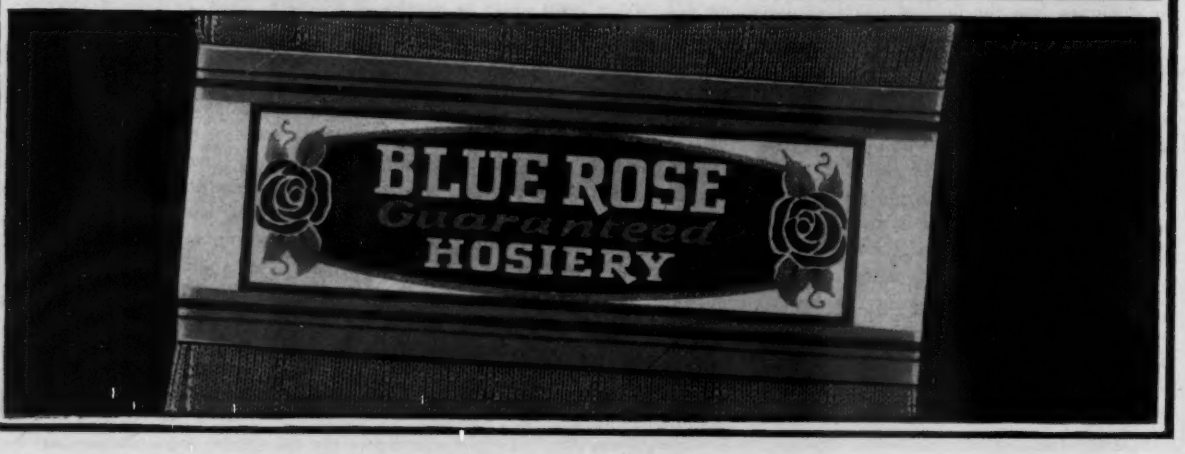

tween raw material and the retailers is shown in frequent offerings of one-time quick-moving half dollar goods by chain stores at as little as 10 cents a leg. Much that manufacturers expected to sell and may have sold for $3.15 a dozen is going over the counter in many retail shops at 25 to 35 cents a pair.

None of the loss falls on retailers, apparently, for it is common knowledge in the trade that dealers often sell, for a time, at 60 to 65 cents a pair, fetching patterns which they had put in stock at $4 a dozen. maximum. In fact, stores operated as part of a chain have paid as little as $3.15 a dozen and sold at 59 to 69 cents a pair. That's what grieves so many manufacturers who feel they have to yield to buyer demand for lower and still lower prices. But novelty is the life of the half hose market, and it looks as though mills will have to produce on a thinner margin of profit or forsake the speculative game. It will be the fault of the knitting machine builders if there come any early waning of interest in gay socks, more a matter of color combination than service.

While a specific information as to the status of plain color silk socks is not available from mills, observers say more of it is in evidence, and it does seem likely that solid color silk will come into more general use. An exceptionally well knitted and finished 12-thread silk sock is available to jobbers for $4.25 a dozen, from a Pennsylvania mill. Another, from a manufacturer in New Jersey, affords a good margin of profit for jobber and retailer if sold for a half dollar a pair. Placing the two side by side, the Pennsylvania stocking probably would be given preference in the better shops, and with clocks, might prove attractive as a dollar proposition. Some style forecasters are pinning faith to clocked half hose as a successor to the fancy.

A mill in Reading, Pa., is sold well ahead on silk socks in colors, going over the counter for a dollar, and the Nolde & Horst Co. is having substantial business in higher priced silk lines. One or two well known manufacturers might be mentioned as having large accumulations of half hose staples, mainly of mercerized yarn.

Underwear.

Slow for a time, the market for men's light weight knitted underwear is seasonally active. Most mills have had about the usual volume of business, but much of it was written since May and there is a strong flow of reorders. It was a wholesome sign when one after another of a limited number of manufacturers advanced prices, even before cotton had reached its peak for the year. A scarcity developed earlier than most jobbers anticipated, and many were caught short of stocks for immediate delivery. Manufacturers were declining orders for spot goods at a rate that caused some distributors to doubt whether shipments could be received in time to fill bare places in their bins. Mills were kept on the jump for weeks, and all through June there was a demand for which some were not prepared. It is the old story, of a few months' business being crowded into a few weeks.

By the beginning of July mills had pretty well caught up with orders and were in position, generally speaking, for taking care of repeats to September. It is expected jobbers will be in the market continuously for fill-in lots to the end of August, and for this reason there is strong opposition in some quarters to naming prices before September for the next light weight season. Some favor July, or August as at the latest, for opening for 1928 deliveries, their contention being that mills will need orders for keeping plants running and maintaining organizations intact. Opponents retort by saying that unless manufacturers have ready-to-ship stocks they should be able to maintain a fair production stage on reorders, as July and August are promising of a considerable volume, and that an opening, with buyers perhaps antagonizing new prices if higher than at present, would cause confusion such as existed following the opening of heavy weights for the current delivery season. It is better, such interests hold, to have a late and snappy opening than an early, draggy one, particularly under conditions such as may arise following somewhat questionable information concerning the cotton crop. Prices named in September would be more likely to stick than if they came out a month or two earlier, it is stated by advocates of a deferred opening.

Men's ribs and bals are having a more satisfactory season than most interests looked for. It is believed in knitted underwear circles that both ribs and bals this year recovered some of the ground that had been lost to nainsooks. It is reliably stated that there are some large and burdensome stocks of nainsooks other than well known branded lines, which have not been immune from competition with garments purposely cheapened for price. Complaint was heard two months ago that nainsooks were not then moving as in recent years, and the blame was laid to a flooding of the markets with goods inferior in construction, which now, it is stated, are available to distributors at prices about equal to the bare cost of the cloth. Designedly cheapened athletic union suits, while made of standard cloth, it is stated, were skimped in the cutting, with no regard whatever for size standards. But this is not a 1927 development. Two years ago a southern manufacturer of the knitted who also was making nainsooks discontinued the latter because of uneven competition due to the offerings of suits of a character regarded certain to adversely affect the whole nainsook underwear industry eventually.

Women's cotton underwear continues in steady call, but the bulk of business of most Pennsylvania mills comes from catalog houses and chain stores. However, manufacturers are, mostly, well situated as to orders for light weights, and some say their plants are assured of capacity operation to August. One reports production sold up to the middle of July, and recently was in arrears with deliveries. A few mills having capacity output say it is divided about evenly as between light and medium weights, that a fair amount of early fall delivery business has been booked.

A Pennsylvania manufacturer who several months ago discontinued making women's cotton underwear is buying rather heavily of rayon cloth, and others in the Schuylkill Valley intend to enter the rayon underwear field this year in preparation for the 1928 spring and summer season. It seems quite certain that more of rayon and less of cotton underwear for women will be manufactured in Pennsylvania next year. But there are mill chiefs who declare they believe the cotton, made in still finer gauge and given a higher finish, has passed through the worst, and that they have no intention of experimenting with rayon.

Modest price advances and withdrawal from sale of the lines of several manufacturers of men's heavy weight cotton ribs gave a better tinge to the market for winter lines. Considerable business has been written since a few of the more courageous manufacturers took the aggressive about

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J. A. FIRSCHING

614 Broad Street **Utica, N. Y.**

the beginning of June. First advances were made by southern mills, and The Washington Mills, Mayodan, N. C., probably was the first to announce temporary withdrawal from the market. Such incidents were viewed by jobbers as a forerunner of an all-around firmer attitude on the part of manufacturers, and jobbers who had contracted conservatively but were slow with detailing or had done no initial buying, slipped into the market quietly for protection against generally higher prices and an eventual tight situation from the standpoint of deliveries from mills to cover for first shipments to retailers. Almost in a twinkling the heavy weight markets changed from buyers' favor to sellers' advantage. It is suggested by some primary market interests that unless "things be messed up by a premature opening of light weights," there is little to fear from disturbance of stability in heavies.

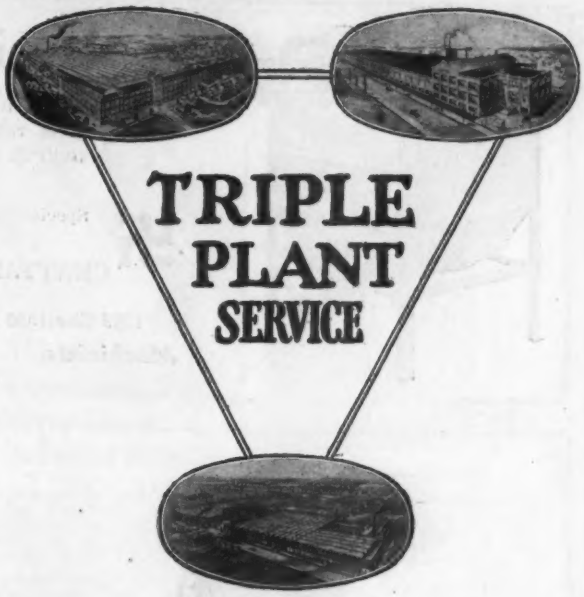
Sweaters.

The one important development in the sweater and bathing suit trades in June was the announcement of a leading spinner of knitting yarns that, effective on the 27th, no orders would be accepted at less than an advance of five cents a pound over the prices which had been prevailing. This followed by precisely one week a declaration by Charles J. Webb, the well known wool merchant, manufacturer and wholesale distributor of woolen and worsted piece goods, that he expected all mills in which he had an interest to "demand and receive prices which would show a profit." Mr. Webb is the father of an executive of S. B. & B. W. Fleisher, Inc., the spinners who subsequently announced the five cents a pound advance in worsted yarns.

Taking worsted spinners as a whole, they have been operating plants for many months at a loss. Some were losers from the time they placed an order on their books. Yarns in the declining market were keeping one jump ahead of the declines in raw wool, and knitters were picking up rare bargains in the highly competitive market. The unsettled situation in yarns had an evil influence in the knitted outerwear trades, and at no time since the opening more than six months ago could mills persuade distributors to place their quota of business. Jobbers did not relish buying beyond known bare needs in a declining yarn market. Whether they will operate more freely, now that the first step in stabilization in yarns has been taken, is a matter of conjecture.

While spinners generally expressed approval of the Fleisher action and manufacturers received the company's announcement with a hearty "Amen," it remains to be seen whether spinners will follow the Fleisher lead. Much will depend on whether there are heavy accumulations of yarns to trouble holders and the extent to which they may be pushed by banks carrying their loans. Numbers of spinners say they believe all will join in the movement inaugurated by the Fleishers. Some declare they do not intend to bind themselves to any understanding, fearing some spinners would not adhere to any established price level if they had to compete for the business that is passing. It is the general impression that if a few spinners continue the cut-throat practice of the last year and more, conditions will be worse than they have been for both spinner and manufacturer, whereas, if all go along there will be improvement for both elements.

As the time in which sweaters must be bought to be put in distribution for fall is narrowing, jobbers are showing a shade more interest in contracting, but it cannot be



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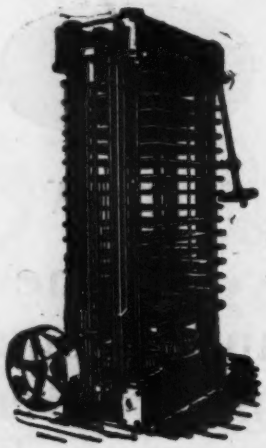

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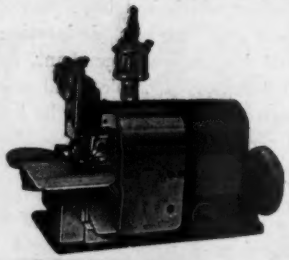

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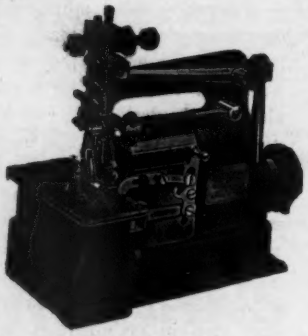

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said that trading is at a stage where it should be, with six months of the year in the past. Jobbers lay the blame for their tardiness to the retail trade, representing that dealers generally are exceptionally slow with their initial orders. However, there is much confidence among manufacturers that their shipments will run ahead of 1926, unless remaining orders still to come be placed so late that goods could not be shipped out in time to take care of consumer demand. Bathing suits began moving in stronger volume with more nearly normal climatic conditions, and the business of the near future will depend on the kind of season ahead for the shore resorts.

Among the Knitting Mills.

Campbell Knitting Mills, Jellico, Tenn., will be rebuilt. The plant was recently destroyed by fire. The announcement is made by Richard Moore, president.

Thirty machines will be installed in the addition being erected at the Hickory Hosiery Mills plant at Lenoir, N. C. The building will be 36x80 feet, one-story.

A new mill at Morristown, Tenn., is chartered as the Morristown Knitting Mills, Inc. Infants' hose will be manufactured. H. F. Trobaugh is president; J. B. Neil, vice-president; J. H. Bell, secretary-treasurer; and L. H. Rayburn, manager.

Knoxville Knitting Mills Company, Knoxville, Tenn., have built an addition to the No. 1 plant, consisting of a third story. This is brick and stucco with steel window frames. The new floor space will be used to house new machinery to provide increased production.

Pen-Co Hosiery Company is the sixth new hosiery mill organized in Burlington, N. C., since the first of the year. It will manufacture men's hose, and the plant will be located in the loft of the Coca-Cola Building. John M. Coble, Coca-Cola bottler, and Ernest Pennington are the chief stockholders.

Another unit will be added to the plant built at Acworth, Ga., by the Unique Knitting Company, it is understood. The main building will be 210x65 feet.

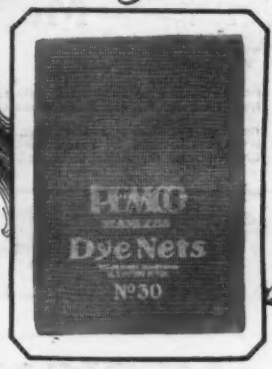
Houston Hosiery Mills, Houston, Texas, will install 15 machines on mens' half-hose which will double the output of the mill on this product. L. A. Parsons is general manager.

An addition to house finishing machinery is being erected at the Charles H. Bacon Company, Lenoir City, Tenn.

Kingsport Hosiery Mills, Kingsport, Tenn., will install, in a recently completed building, twelve full-fashioned machines from Germany. William Hodges is manager.

Indiana Textile Mills Co., Indiana, Pa., is erecting a plant for the manufacture of full-fashioned hosiery.

The Millheim Knitting Mills, Inc., Millheim, Pa., was merged with the Penn Valley Hosiery Mills, Inc., Philadelphia, as of June 1, without any change in the managements of the two corporations. The original plant, at Millheim, becomes Mill No. 1, the recently established mill in Philadelphia is No. 2, and the smaller plant, at Milroy, Pa., formerly a branch of Millheim, is No. 3, the latter making children's sports and misses' hose. The product of the Millheim factory is boys' hose and children's hose, the daily output amounting to 2000 dozen pairs a day. For some time the plant has been and still is being operated day and night. Mill No. 2 is equipped with 260 and 300

Dye Nets of Greater Tensile Strenth


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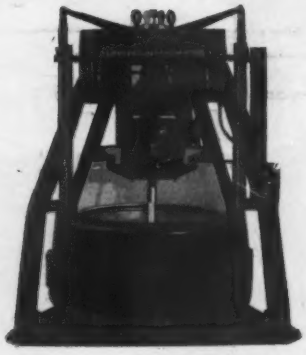
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spring needle machines and is knitting service weight silk to welt and chiffon hosiery. The business of all of the mills is being conducted from the office of Mill No. 2, which went into production less than three months ago, and is reported well supplied with orders.

The Vogue Silk Hosiery Mills, an addition to the full-fashioned hosiery industry in Philadelphia, got started on production last month with six 45 gauge Reading machines and is knitting three-thread silk to top. The principals in the concern are Samuel and John Tait, brothers, who formerly were of the Howard Hosiery Co., and Edward Wilkinson. All are expert full-fashioned knitters, and until additional equipment has been installed, will constitute the knitting force.

Announcement is made that the Kraemer Hosiery Co., Nazareth, Pa., which was reported to have been purchased by the Cadet Knitting Co., Philadelphia, as a part of the proposed merger of seven full-fashioned corporations, will not enter the combination, but will continue to operate as in the past, no change in its affairs being contemplated. This leaves but two companies for the intended new company to be incorporated as the Cadet Hosiery, Inc. There is a well-grounded rumor that a Philadelphia mill distributing through jobbers has been offered to and may become a unit in the proposed merger, and that the owners, in the event the deal goes through, will establish a mill elsewhere than Philadelphia. As matters stand, the Cadet and the Lansdale (Pa.) Silk Hosiery Mills remain as the nucleus of a combination.

Incidental to a recent sharp revival of interest in womens' seamless hose there has developed acute demand for used Scott & Williams Model K 3½-inch cylinder 260 needle machines. Very little used equipment of this type is being offered for sale and what is available is commanding higher prices than manufacturers in quest of it seem willing to pay. There appears available much second-hand 260 spring needle machines. One such complete plant for some time has been on the market.

There is reported a good market for coarse gauge underwear knitting machines adapted to the manufacture of sweaters. Two lines of sweaters knitted on such machines are on the market, one, of all-cotton, selling in retail stores for $1.50 and the other a profitable proposition at $2.50 both being brought out by underwear manufacturers who were confronted with the alternative of selling their machines or finding other uses for them.

Knitted Novelties for Fall.

Manufacturers of knitted novelties are vieing with one another to see who can get out the most sensational article to pay homage to Colonel Charles Lindbergh, and all sorts of things are being experimented with. The newest made in hats is on the order of the "Lindy Lid," made with a close fitting turban effect, the propeller in the form of an ornament on the front, and the wings extending out at the side. The hat is shaped in the back like an aeroplane, and, at the moment, it is believed to be one of the most promising novelties for the early fall season. They are made in angora, iced-wool and light weight worsteds in plain colors and combinations, but it is believed the tans and grays would be the most promising. Some shades of blue have also been featured. It was said that "lids" of this sort would be likely to strike the fancy of the younger set

Boiling Off
In boiling off, add some Star Brand to increase the ability of the solution to emulsify fatty substances in the cotton. Star Brand in the cotton boil helps to bring the fibre out to a superior white. Star Brand is a clarified, transparent silicate made for textile purposes.
Philadelphia Quartz Co.
Philadelphia

and be the means of introducing the knitted hat for street wear. Manufacturers have been trying to bring out knitted hats for several seasons, but believe they now have something as a basis for their advertising.

Many manufacturers handling rayon yarns are making knitted belts and ties for men. There is a good demand for the knitted belts for women, and some anticipate featuring them for the holiday trade in plain colors, stripes, checks and some dotted effects. It was said that jacquards promise to be favorites for the early season. Some lines are being advocated for late summer in white and pastel colorings.

Aeroplane motifs, hand embroidered, decorate the new lines of hosiery and some sports lines for men in worsted and rayon. Plaids, checks and stripes have also been included and some of the novelty motifs have been used in the cuffs for men and on the instep for women in dainty colorings and silk floss. The effect is rather unique, but it happens to appeal to the young women of the present day. There are numerous white silk and rayon numbers being featured at the present time by some manufacturers who are trying to catch the popular trend of the day.

Aeroplane motifs are being bought from manufacturers making a specialty of this type of work and attached to the sweaters, frocks and scarfs, sewed on the same as the monograms have been attached at various times when they were popular. There are some worked out in worsteds which are featured on the rayon and silk garments.

In fact the knit goods firms have "got the flying fever" and in any way possible this type of decoration is being featured, although done in such a way that when the fad passes the trimming can be removed without any injury to the garment. But this is the big sports idea of the moment.

Other novelties which are being presented at the moment are featuring changeable color effects. They are made with two or more colors which blend unusually well and are very unusual in the bright light. This is particularly true of frocks and sweaters.

One manufacturer has suggested that an iridescent stocking would be something that might attract attention for the holiday trade. He claims that iridescent glass, beads, fabrics and many other articles are wanted in that effect and he believes that a white iridescent stocking for evening would be unusually effective and has said he was going to try out the idea to see if it couldn't be done. Another, when asked if that was possible, said he believed it was, but had never tried it out up to the present time, and from the way he spoke it was believed that he, too, would try it out this season.

Commercial Fibre Additions.

John G. Motz, 1512 Widener Bldg., Philadelphia, Pa., who has had the Chatillon Rayon account for many years and previously was associated with Fred Wolstenholne is to represent the Commercial Fibre Co. of America, Inc., in the Philadelphia territory.

Wallace A. Parr, 730 So. Los Angeles St., Los Angeles, California, has been appointed sales representative for the Commercial Fibre Co. of America, Inc., for the Pacific Coast.

Benjamin H. Hedges resigned from Vivanti Bros. to become sales representative for this city of the Commercial Fibre Co. of America, Inc., to call on silk manufacturers.

Some Remarks on Sulphonation.

BY E. L. FLETCHER.*

There are few processes about which there are so many fearful opinions held and expressed as the successful sulphonation of vegetable and animal oils. It is considered quite a trick to produce the same results consistently on any given oil, and by some connected with the trade remarks are frequently made such as, "It cannot be done in such a climate" and "Impossible to accomplish below latitude 40 degrees."

While this writer admits that it is a difficult process, he also cannot speak too strongly against such arbitrary remarks as the foregoing, which, in his experience, is founded on nothing but belief and that not very strong. Too, the sulphonation of castor oil is successfully carried on in India where the climate is considerably warmer than the south side of latitude forty.

The process of sulphonation is difficult. This is owing to the nature of the reactions involved and control in process and finishing, and does not depend on location. Sulphonation, throughout, involves the employment of a series of reactions each of which shall proceed to a definite point and then be stopped, and only one of which can be completely carried out. This one is the removal of all sodium sulphate employed in prior washings and formed when occluded mineral acid is neutralized. It is important that all sodium sulphate shall be removed, for a high grade finished product should contain none.

It may easily be seen that a process involving partial reactions can be far more difficult than those running to complete reactions. In all reactions involved in sulphonation too little is ruinous and too much disaster.

It is well known that when the reaction of sulphuric acid—in the beginning of the process—is permitted to go too far, what evil is done. To complicate matters not one but two things may cause this. One, the time involved, and the other the temperature. Trouble at this point is so feared and respected that most "off test" oils observed by the writer have shown a tendency to be under sulphonated at this point.

If this first reaction is accomplished satisfactorily there are two other hazards to be negotiated whereat the process may fall by the wayside; at the first neutralization and on finishing. The same two evils are here to be chosen—too much and not enough.

In addition to these reactions, other opportunities present themselves to yield an inferior product. Chilling with various wash waters; finishing at too cold a temperature; having too great a variance in temperature of the mix and reagents added, and others.

This is just an idea of how much care and understanding is needed to secure a good grade of sulphonated oil. It is the manner by which these objects are accomplished and the evils avoided, that are the sulphonating secrets which are so jealously guarded. Whereas all who are familiar with oil technology understand sulphonators are relatively scarce. What works perfectly with one unit will not always work with another. Speed of agitation as against amounts involved; the rapidity of temperature controls, size of jackets and coils, all have a marked effect and all must be understood to accomplish consistent results to make successful sulphonated textile oils.

*Manager Production and Research, Burkart-Schier Chemical Co., Chattanooga, Tenn.